TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34

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Dedicated to

my

family

&

Teachers

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Successful completion of a task is often less due to individual talent than to the fact that the person has been blessed by the ***GOD ALMIGHTY*** *and she is fortunate enough to be with those who can show her the right path.*

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ABBREVIATIONS

ROP	RETINOPATHY OF PREMATURITY
VEGF	VASCULAR ENDOTHELIAL GROWTH FACTOR
GA	GESTATIONAL AGE
BW	BIRTH WEIGHT
LBW	LOW BIRTH WEIGHT
ICROP	INTERNATIONAL CLASSIFICATION OF ROP
ETROP	EARLY TREATMENT ROP
NICU	NEONATAL INTENSIVE CARE UNIT
GMS	GRAMS
WKS	WEEKS
AGA	APPROPRIATE FOR GESTATIONAL AGE
SGA	SMALL FOR GESTATIONAL AGE
LGA	LARGE FOR GESTATIONAL AGE
RD	RETINAL DETACHMENT
MMHG	MILIMETER OF MERCURY
RR	RELATIVE RISK
VLBW	VERY LOW BIRTH WEIGHT
ANTI-VEGF	ANTI-VASCULAR ENDOTHELIAL GROWTH FACTOR
SD	STANDARD DEVIATION
SPSS	STATISTICAL PACKAGE FOR SOCIAL SCIENCE

M	MALE
F	FEMALE
IVF	INVITRO FERTILIZATION
RDS	RESPIRATORY DISTRESS SYNDROME
NNH	NEONATAL HYPERBILIRUBINEMIA
HTN	HYPERTENSION
IVH	INTRA VENTRICULAR HAEMORRHAGE
BT	BLOOD TRANSFUSION
PDA	PATENT DUCTUS ARTERIOSUS
PIH	PREGNANCY INDUCED HYPERTENSION
GDM	GESTATIONAL DIABETES MELLITUS
RDF	REVERSAL OF DIASTOLIC FLOW

ABSTRACT

Introduction: Retinopathy of prematurity (ROP) is a neovascular eye disease that affects the developing retina in premature infants. Various studies have proposed multiple risk factors in association with ROP. There have been multiple studies done on ROP in western countries but there are only a few from northern India and especially from Punjab region. Thus, we conducted this study to assess the incidence and risk factors of ROP in our institute.

Aim of Study: To determine the incidence of retinopathy of prematurity in preterm neonates and associated risk factors.

Materials & Methods: Our study included preterm neonates with GA $\leq$34 weeks born in or referred to Dayanand medical college and hospital, Ludhiana, Punjab from November 1,2018 to March 31,2020. After obtaining detailed clinical history, neonates were divided into AGA or SGA. Incidence of ROP and risk factor analysis was done.

Result: Out of 290 screened neonates, 240 (82.8%) were AGA and 50 (17.2%) were SGA. The mean birth weight and gestational age were 1292.7$\pm$317.65 grams and 30.13$\pm$2.2 weeks respectively. The overall incidence of any-stage ROP is 30.6%.The incidence of ROP in AGA and SGA was 30.2% and 33% respectively (p = 0.58). Male sex, anemia, oxygen administration, surfactant administration, sepsis, multiple pregnancy and PIH were independent significant risk factors for ROP on multivariate analysis.

Conclusion: This study showed that both AGA and SGA premature infants have similar incidence of ROP. Low BW and GA are the significant risk factors for any stage ROP.

Keywords: Retinopathy of prematurity, Gestational age, AGA, SGA.

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INTRODUCTION

Retinopathy of prematurity (ROP), previously known as retrolental fibroplasias is a multifactorial vasoproliferative retinal disorder of premature infants.[1] An array of risk factors are proposed to be responsible for ROP.[1,2] The spectrum of ROP ranges from mild cases without visual sequelae to advanced cases with bilateral irreversible blindness.[3]

The possible mechanism of injury suggested for pathogenesis of ROP is vasoconstriction, increase in level of vasogenic factors like vasculo-endothelial growth factor (VEGF) and compensatory neovascularisation due to ischaemia, leading to severe extra retinal fibro vascular proliferation and retinal detachment.[1]

Retinal vascular development begins at 16th week of gestation through vasculogenesis, which is a process of de novo development of vasculature involving proliferation, differentiation and organization of blood vessels. Angiogenesis then proceeds to extend the retinal vasculature to periphery, completing it nasally by 36th week and temporally by 40th week of gestation.[3]

Many risk factors are proposed to be associated with ROP like low gestational age (GA), low birth weight (LBW), prolonged oxygen exposure, severity of neonatal illnesses, severe respiratory distress requiring mechanical ventilation, shock, sepsis, hypoxia, prolonged ventilator support, blood transfusion, intra-ventricular hemorrhage, acidosis, anemia, high ambient light, vitamin E deficiency.[1,2]

Incidence of ROP has been reported variously from 35 to 60% in various studies.[4-6] ROP is emerging as one of the leading cause of preventable childhood blindness.[2] The percentage of pediatric blindness contributed by ROP range from 3-11% in highly developed countries and as high as 60% in developing countries.[7-9]

ROP is not detected before 32 weeks of GA. The median age at detection of stage 1 ROP is 34 weeks and threshold ROP is 34-38 weeks. So the crucial period for detection of ROP is from 34-38 weeks. At this age the

infant is likely to reach the threshold stage of disease and appropriate treatment at this stage may prevent the blindness.[10]

The most widely used classification for ROP is the International Classification of Retinopathy of Prematurity (ICROP). ROP is categorised based on the severity of the disease into stages (0-5), location of the disease into 3 zones (Zone 1-3), extent of the disease based on clock hours (1-12) and the presence of plus disease.[11]

Early treatment retinopathy of prematurity (ETROP) study classified ROP into type 1 and type 2 ROP. Prompt treatment is indicated for eyes with type 1 ROP and continued serial observations without treatment are recommended for eyes with type 2 ROP.[12]

Presence of ROP on the first examination, posterior location, increasing severity of stage, circumferential involvement, plus disease and rapid progression are the risk factors which necessitates treatment.[1]

There are multiple treatment modalities available for management of ROP like laser photocoagulation, cryo therapy and anti-VEGF therapy.[3,12]

Infants with significant ROP have increased risk of high myopia, refractive errors, strabismus, amblyopia, astigmatism, retinal detachment and glaucoma.[1,10,13]

Currently no definitive methods are available for the prevention of ROP. Since most of the risk factors associated with ROP mentioned above arise in the neonatal intensive care unit (NICU) itself and most of them are avoidable, cautious monitoring of the risk factors, early screening, follow up and surgical intervention have been shown to reduce the incidence and improve the outcome of ROP.[2] Some studies observed that the incidence of ROP is more in small for gestation age babies compare to appropriate for gestational age babies, but other noted no difference.[14-17] So, In view of paucity of Indian studies on the incidence and risk factors of ROP specially from the northern parts of India, the present study was undertaken.

AIMS AND OBJECTIVE

1. To determine the incidence of ROP in preterm neonates≤34wks and associated risk factors.
2. To compare the incidence of ROP in preterm SGA neonates with preterm AGA neonates.

REVIEW OF LITERATURE

ROP is a vasoproliferative disease of developing retina. ROP is classified base on IC-ROP classification.[11] Retina is divided into 3 zones to describe the location of ROP. Zone 1 is defined as the circle, the radius of which is twice the distance between the center of optic disc and center of macula. Zone 2 is defined as the area from the edge of the zone 1 peripherally to a point tangential to the nasal ora serrata. Zone 3 is the residual temporal crescent of retina anterior to zone 2. Severity of disease is graded into 4 stages as follows (figure 1)

Stage1 (Demarcation line)- a thin delicate line like white structure separating vascular and avascular retina

Stage 2 (Ridge)- a thick line extending above the plane of retina

Stage 3- extra retinal fibro vascular proliferation

Stage 4- partial retinal detachment (RD)

4(a) - extra fovea: partial RD not involving macula

4(b) - fovea: partial RD involving macula

Stage 5- total retinal detachment

Extent of the disease is defined by the hour of the clock from 1-12.

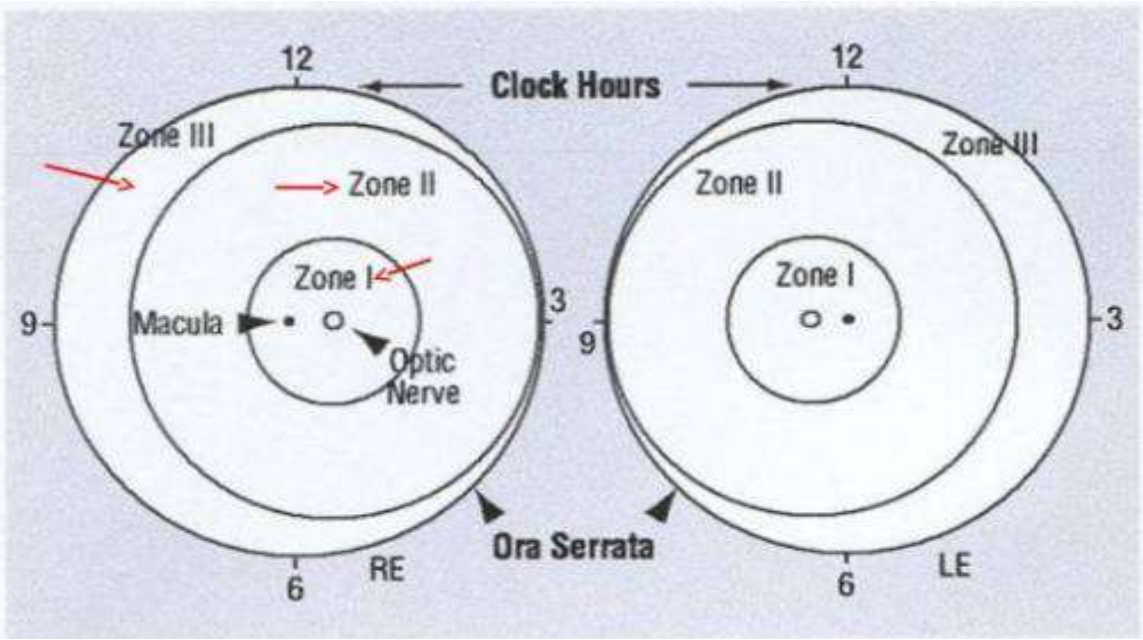


Figure 1- Distribution of Zones of retina

Plus Disease- It is used to indicate abnormal vascular dilatation of posterior pole vessels in the presence of peripheral retinopathy. It is significant because it has a tendency to progress.

Pre Plus Disease- A recent classification uses this term to describe eyes in which peri papillary vessels are not normal, but not sufficiently abnormal to be called plus disease. Used to indicate clinicians that frequent examinations may be needed.

Various studies have been conducted till date to evaluate the incidence and risk factors in relation to ROP.

Prendiville A, Schulenburg WE at London in 1988 did a prospective study, to determine the incidence and severity of ROP in inborn infants of less than 1500 gms at birth and the risk factors associated with the development of ROP in infants of less than 31 weeks GA. 140 infants were examined, and 42 (30%) developed ROP. 15 of these infants had progression to advanced disease (stage III or stage IV). 117 of the infants were of less than 31 weeks of GA and 34 of them developed ROP. Three risk factors: acidosis with a pH less than 7.2, hyperoxia with an oxygen tension more than 12 kilo Pascals and GA, were found to be independent risk factors associated with the development of ROP. [18]

In 1991, Palmer EA at Portland did a multicenter trial on incidence and early outcome of ROP in 4099 infants of birth weight less than 1251 gms by serial ophthalmic examination from 4-6 weeks. They found the overall incidence of ROP to be 65.8% and 81.6% in infants less than 1000 gms. Incidence was closely related to the post conception age than the postnatal age indicating that the level of maturity governed the age of onset rather than the environmental influence.[19]

Flynn JT at Miami in 1992 did a cohort study on transcutaneous oxygen tension and incidence and severity of ROP in 101 preterm infants of birth weight 500-1300 gms requiring continuous oxygen. They were monitored for transcutaneous oxygen levels and it was concluded that there was

positive correlation between incidence and severity of ROP and continuous oxygen levels of more than or equal to 80 mmHg.[20]

Mittal M at Washington in 1994 did a prospective study on Candida sepsis and its association with ROP in 253 preterm babies of 1000 gms. It was concluded that candida sepsis is independently associated with increased severity of ROP and the need for laser surgery in extremely low birth weight infants.[21]

Study on incidence of ROP in a neonatal care unit in 1995 from Chandigarh by Charan R determined the incidence of ROP in a prospective manner. 165 preterm babies of birth weight ≤1700 gm were examined over a period of 1 year. An incidence of 47.27% of ROP was detected. The maximum stage reached was stage 1 in 16.97%, stage 2 in 17.58%, stage 3 in 11.52% and stage 4b in 1.21% babies. Plus disease was present in 10.3% babies. The study recommended screening for all babies weighing less than or equal to 1700 gm.[22]

In 1996, Rekha S at Bangalore took up study on incidence of ROP in high risk babies of NICU with a study of risk factors. The overall incidence of ROP was found to be 46%, in babies with birth weight less than 1000 gms, it was 73% and in less than 1500 gms, it was 47%. Oxygen therapy and anemia were found to be independent risk factors. They concluded that all the preterm babies should be screened.[5]

Higgins RD, in 1998 at New York did an observational cohort study in preterm's less than 1250 gms to assess the risk factors of ROP in urban population. 63 infants were included in the analysis. Infants whose mothers received antenatal dexamethasone had a significantly less chance of developing ROP that was stage 2 or higher than the infants without a history of antenataldexamethasone exposure. The association was stronger when the analysis was restricted to infants who were 24 to 28 weeks of GA. Birth weight, GA, respiratory distress syndrome, bronchopulmonary dysplasia, and patent ducts arteries us were also found

to be having significant association with the development of ROP that was stage 2 or higher.[23]

Gupta VP in 2004 at Delhi in his cohort study of 60 preterm's on risk factors of on ROP concluded that indirect ophthalmoscope should be performed at 4 weeks of postnatal age in all preterm babies of birth weight less than or equal to 1500 gms and the screening should be intensified in the presence of risk factors like oxygen administration, apnoea and septicemia. The incidence of retinopathy was 21.7% in the cohort, 33.3% in babies of less than or equal to 32 weeks of GA and 36.4% in babies weighing less than or equal to 1250 gm. Oxygen administration, sepsis and apnoea were found to be independent risk factors of ROP. ROP was significantly more severe in babies with hyaline membrane disease and lower birth weight. Severe disease was never seen before 6.5 weeks of age.[24]

In 2008, Chawla D did a study at New Delhi on the risk factors of ROP and concluded that with improved survival of very low birth weight infants in India, ROP is becoming a significant problem. The most important amongst the risk factor of ROP was prematurity. Other factors like, problems with oxygenation, frequent blood transfusions, sepsis and apnea have also been implicated in the causation of ROP. The study also suggested that a good screening program is essential for the early detection and treatment of this condition since ROP is essentially asymptomatic in the initial stages.[25]

In 2009, Austegn D in Sweden did a study on the incidence of ROP in extremely preterm infants less than 27 weeks during a 3 years period at Sweden. They concluded that ROP had an incidence of 72.7%. The study also revealed that GA had a stronger correlation with ROP than birth weight and risk of ROP decreased by 50% for each week of GA at birth.[26]

In 2008, Fortes Filho did a prospective cohort study which included preterm infants with birth weight (BW) ≤ 1,500 grams and gestational age (GA) ≤ 32 weeks and divided into two groups: AGA or SGA. A total of 345

patients were examined: 199 included in the AGA group and 146 in the SGA. The prevalence of any stage ROP and severe ROP (needing treatment) was 29.6 and 7.0%, respectively. ROP in any evolutive stage developed in 66 AGA (33.2%) and in 36 SGA (24.7%) (p = 0.111). Severe ROP occurred in 15 AGA (7.5%) and in nine SGA (6.2%) (p = 0.779). This study has shown that being SGA was not a significant risk factor for any stage ROP or for severe ROP in this cohort and, also, that the risk factors for ROP were similar among SGA and AGA very-low- birth-weight preterm babies.[14]

In 2011 SumruKavurtet al,did a prospective study on neonates with gestational age ≤32 weeks or birth weight ≤1500g. Of the 495 neonates screened, 43 (8.7%) infants were small for gestational age; the frequency of severe retinopathy of prematurity was 5.8%. Sepsis and being small for gestational age were independent risk factors for severe retinopathy of prematurity.[15]

In 2008 C A Dhaliwal et al, did a prospective cohort study on 1413 infants with birth weight of<1500 g and gestational age of <32 weeks; 329 (23%) were SGA. The study showed that SGA infants born at GA 26-31 weeks were more likely to develop any stage ROP (p<0.01) than their AGA peers. They were also more likely to develop severe ROP (GA 26-27 weeks, p<0.01; GA 28-19 weeks, p= 0.01; GA 30-31 weeks, p=0.01).[16]

Claudette Bardin did a retrospective Comparison of two historical cohorts of small-for-gestational age (SGA) and appropriate-for-gestational age (AGA) infants born between 24 and 26 weeks of gestation (gestational age estimated by early ultrasound at 16 to 18 weeks) in 1997. Forty-one (21%) of the 191 infants were classified as SGA. Those with congenital anomalies (10% in the SGA and 2% in the AGA group) were excluded from further analysis. This study showed that SGA infants were at greater risk for developing severe ROP (stage ≥III) (65% vs 12% for AGA).[17]

In 2017, Manohar saikothuri et al, did a study on 186 newborns admitted to the neonatal intensive care unit (NICU) of Bharati hospital (BVDUMC),

Pune, India with gestational ages <32weeks or birth weights <1500g from January 2015 to September 2016 and compared to 374 babies screened for ROP from January 2010 to July 2012. The study showed an increase in the incidence of ROP from 12% in 2010- 2012 to 19.9% in 2015-2016. 10 (27%) babies with ROP required laser photocoagulation in 2015-2016 in comparison to 27 (40%) babies with ROP who needed laser photocoagulation in 2010-2012. Gestational age, birth weight, mechanical ventilation, oxygen therapy, packed cell transfusion, surfactant administration and bronchopulmonary dysplasia had statistically significant associations with ROP.[27]

Ratheesh Raj et al did a prospective study on preterm babies <34 weeks of gestational age (GA) and/or <1500 g of birth weight admitted in NICU and sent for ROP screening from April 2014 to September 2016. Patients were divided into two groups using Lubchenco growth chart. Group 1 consisted of all preterm babies with weight AGA. Group 2 consisted of preterm babies born with weight <10thpercentile over GA called SGA. Out of the 300 babies, who were included in the study group, 67 babies belong to the SGA group and rest 233 babies were appropriate for age (AGA). The overall incidence of ROP was 29% and it was increased in SGA group to 40%. ROP incidence in AGA was 25.8%. the study concluded that , the incidence of ROP is higher in SGA babies compared to AGA babies, but Being small for gestation is not an independent risk factor for developing ROP. The study also showed a significant association of apnea, low pO_2, lower GA, blood transfusion and maternal GDM with ROP.[28]

Jasmina Alabegovic-Halimic et al conducted a retrospective study on 80 premature born children in the period from January to May 2015, to establish the number of patients with development of retinopathy of prematurity active forms and examine which risk factors have most significant impact on its origin. The active form of ROP developed in 6.2% of cases, while in 93.8% of cases there was a spontaneous resolution.

Patients who developed active form of ROP have significantly younger gestational age (26.4±1.5 weeks) and lower birth weight (874±181 grams), lower Apgar score in the first and fifth minute and were longer on oxygen therapy (20±3.4 days).[29]

Yau et al conducted an retrospective study on all neonates of multiple gestation screened for ROP between January 2007 and December 2012 in 2 neonatal intensive care unit in Honkong, to determine the incidence and risk factors of retinopathy of prematurity (ROP) among new born Chinese infants of multiple gestation. Of these 153 infants included in the study, 141 (92.2%) were twins and 12 (7.8%) were triplets. ROP of any stage developed in 18 infants (11.8%) and Type 1 ROP developed in 6 (3.9%) infants. The study concluded that, in preterm Chinese infants born from multiple gestations, prematurity, lighter weight, postnatal hypotension, inotropes use, brochopulmonary dysplasia, and intraventricularhemorrhage were common independent risk factors for the development of ROP.[30]

A prospective study conducted by Dos Santos Motta MM et al, to verify the incidence of any stage of ROP and threshold ROP in singletons and in multiple gestation among preterm infants with birth weight (BW) of 1500 g or less and/or gestational age (GA) of 32 weeks or less, as admitted to the neonatal units at Laranjeiras and Amparo Hospitals in Rio de Janeiro, Brazil, between January 2001 and July 2005, and whom remained hospitalized for at least 28 days. A total of 159 infants that remained in neonatal unit care for at least 28 days were included in this study. Group 1 comprised 56 (35%) multiples; and Group 2 comprised 103 (65%) singletons. Among the 56 multiples, 30 (53.6%) achieved any stage ROP, and among 103 singletons, 36 (35%) achieved any stage ROP (Chi-square test $P < 0.05$). Threshold ROP occurred in 12 (7.5%) of the 159 patients included. Three (5.3%) patients from Group 1 and nine (8.7%) patients in Group 2 reached threshold ROP needing laser treatment

(Fisher's exact test P > 0.05). This study showed higher frequency of any stage of ROP in twins and triplets but not regarding threshold disease.[31]

Frilling R et al conducted a study on 99 infants from multiple gestation births and weighing < or = 1500 g at birth and matched with infants from single births to clarify the relationship of multiple gestation to retinopathy of prematurity (ROP). There was no significant difference in the incidence of ROP between the twins and the singletons (relative risk [RR] = 0.84, 95% confidence intervals [CI] = 0.61, 1.16). This study confirmed that very low birth weight (VLBW), not single or multiple gestation, was the most significant predictor of ROP occurrence in either group. In 27 pairs of twin siblings from the original twin group, where both weighed < or = 1500 g at birth, we found that the second-born twin seemed at higher risk for developing ROP, but logistic regression showed that the lower birth weight of the second twin, not birth order, was the more significant predictor of ROP. [32]

Hakeem Aha Abdel et al conducted a prospective study from January 2009 to December 2010, on preterm neonates with a gestational age of 32 weeks or less at birth and a birth weight of 1500 g or less, to estimate the incidence of ROP preterm infants in NICU of Al-Minya University Hospital in Egypt, to identify the risk factors which predispose to ROP and to assess the outcome of these cases. Out of the studied 172 infants, 33 infants (19.2%) developed ROP in one or both eyes; 18 (54.5%) cases stage 1, 9 (27.3%) cases stage 2 and 6 (18.2%) cases stage 3 with plus disease. Low gestational age, sepsis, oxygen therapy and frequent blood transfusions were found to be significant risk factors for ROP.[33]

Akkoyan Imran et al conducted a study to evaluate the risk factors in the development of mild and severe retinopathy of prematurity (ROP) in 88 infants with gestational age ≤34 weeks and follow-up of 43 weeks post conception over a 2year period. The study group was classified into three subgroups: group A included patients without retinopathy; group B included patients with stage 1 or 2 (mild-ROP); and group C included

patients who progressed to moderate or severe stage 3 (severe-ROP) and were treated. Logistic regression analysis showed birth weight (BW) (p = 0.019) and respiratory distress syndrome (p = 0.029) as independent significant risk factors for the development of stage 1 and 2 ROP, with BW (p < 0.0001) as an independent significant risk factor for the progression to stage 3 ROP. Total volume of blood transfusion and duration of artificial ventilation were also found to be risk factors with high rates of stage 3 ROP. In group C, BW ≤1000 g (p = 0.0002) and gestational age ≤28 weeks (p < 0.0001) were significant risk factors associated with higher rates of ROP. This study showed BW and respiratory distress syndrome as independent risk factors in the development of mild ROP and BW in the development of severe ROP.[34]

RajsekharDyaberi prospectively studied 140 babies with gestational age at birth less than 34 weeks and birth weight less than 1750 grams at NICU of KIMS Hospital Hubli, Karnataka from December 2015 to 2016, to analyse different parameters responsible for occurrence of retinopathy of prematurity (ROP). Incidence of ROP was found to be 27.14%. Stage 1 ROP was in 11 babies (7.85%), stage 2 ROP in 24 babies (17.14%), stage 3 ROP in 2 babies (1.42%) and Aggressive Posterior Retinopathy of Prematurity (APROP) was found in 1 baby (0.71%). Factors which were having association with ROP by univariate analysis are gestational age at birth (p=0.005), birth weight (p=0.005), respiratory distress syndrome (RDS) (p=0.017), oxygen therapy (p=0.020), sepsis (p=0.001) and blood transfusion (p=0.002). Among them factors which were having independent association by multivariate analysis are birth weight (p=0.007, Odds ratio 12.581), sepsis (p=0.022, Odds ratio 5.427), blood transfusion (p=0.009, Odds ratio 23.054).[35]

Gaurav Paranjpe et al did a retrospective study on 233 infants admitted to the NICU between July 2017 and July 2019, who met the criteria for ROP screening: (a) ≤32 weeks of gestation, (b) ≤1.500 kg of birth weight, (c) infants with significant risk factors including sepsis, respiratory distress

syndrome, or long-term oxygen use, to evaluate the incidence of ROP and its associated risk factors. Incidence of ROP was found to be 35.62% among the babies screened (n=83) majority of whom had stage 1 ROP (83.13%). Maximum incidence was seen in neonates of gestational age between 32-35 weeks (54.22%) and neonates of birth weight between 0.750 and 1.500 kg (85.54%). Prematurity, Low Birth Weight (LBW), high oxygen supplementation, respiratory distress syndrome were found to be independent risk factors in the development of ROP in neonates.[36]

Baljeet Maini et al did a prospective study on 148 preterm infants with gestational age ≤34weeks to evaluate the incidence and risk factors of ROP and to assess the effect of antenatal betamethasone on ROP. Overall incidence of ROP (any stage) was 44.6%. Severe ROP was mainly detected in <1200 g birth weight and/or <30 weeks gestational age. Antenatal betamethasone was associated with non-severe form of ROP ($P < 0.05$) on univariate analysis, but could not pass multivariate logistic regression analysis. Low birth weight and low gestational age emerged as independent significant risk factors along with blood transfusion and acidosis. Antenatal betamethasone may be preventive for severe ROP.[37]

A prospective study done by Samatha P. Shetty et al from October 2012 to September 2014 on 94 new-borns with gestational age < 36weeks and birth weight of < 2000grams, showed that 12 cases (12.76%) had ROP; in which 6.38% were in stage 1 and 6.38% were in stage 2. Most of the positive cases were below 34 weeks of gestational age and weighed less than 1500grams at birth. Longer duration of hospital stay, higher duration of NICU stay, sepsis, hyperbilirubinemia, hypocalcemia, previous preterm delivery were some of the factors found to be significantly associated with ROP in this study? Max pO_2 with a mean of 97.4% in ROP positive cases was also found to be statistically significant.[38]

Rohit Kapoor et al conducted a prospective study from January 2011 to 2012 on 278 newborns with birth weight ≤ 1800grams, to analyze the incidence and risk factors for ROP. Incidence of ROP in babies with ≤

1800grams and 1501-1800grams were 13.67% and 11.64% respectively. Multiple gestation, blood transfusion, antepartum hemorrhage, pregnancy induced hypertension, mechanical ventilation was independently significant for ROP causation.[39]

Shakir Mohamed et al did a retrospective study from 2003 to 3007 to evaluate the relationship of hyperglycaemia and development of ROP in all premature infants with <32 weeks of gestation. This study suggests that hyperglycaemia is associated with the development of ROP in premature infants.[40]

There are various treatment modalities available for type 1 ROP. A preliminary three-month outcome of a multicenter randomized trial of cryotherapy for treatment of retinopathy of prematurity (ROP) on 172 newborns showed that, An unfavorable outcome was significantly less frequent in the eyes undergoing cryotherapy (21.8%) compared with the untreated eyes (43%).[41]

A multi centered study of the safety and efficacy of cryotherapy in treating severe retinopathy of prematurity was conducted on 9751 infants with birth weights less than 1251 g at 23 study centers. 291 infants developed a defined threshold rop, and cryotherapy was performed in approximately half of the eyes through a randomization protocol. 12months after randomization, an unfavorable outcome was seen in 25.7% of the eyes that received cryotherapy compared with 47.4% of the control eyes (P less than .0001). Teller Acuity Card assessment of grating acuity was performed in this study group and indicated an unfavorable functional outcome in 35.0% of the treated eyes compared with 56.3% of the control eyes (P less than .0001). These results indicate that cryotherapy reduces the risk of unfavorable retinal and functional outcome from threshold retinopathy of prematurity.[42]

Lira et al conducted a study at the Federal University of Pernambuco in Brazil between January 2004 and January 2006, to evaluate the efficacy of green laser photocoagulation in threshold ROP. 31 eyes of 22 neonates

were lasered using Frequency-doubled solid state laser, diode-pumped, with 532 nm wavelengths. Regression of the disease after laser therapy was observed in 30 eyes (96.7%). Despite treatment one eye presented stage 4A. Only 7 eyes required repetitive laser therapy. The study concluded that Green laser photocoagulation remains an effective and safe alternative to red laser photocoagulation and to cryotherapy in the treatment of threshold ROP.[43]

JA McNamara et al conducted a prospective study on 22 infants with “threshold” stage 3+ retinopathy of prematurity (ROP), to compare the efficacy of transscleral cryotherapy versus laser photocoagulation delivered by the indirect ophthalmoscope. Fifteen of 16 eyes randomized to laser and 9 of 12 eyes randomized to cryotherapy showed regression. The results suggest that laser therapy is as effective as cryotherapy in the treatment of ROP ($P = 0.285$).[44]

Joo Yong Lee et al conducted a retrospective study on 15 patients with moderate to severe stage 3 ROP, to investigate laser photocoagulation and intravitreal bevacizumab efficacy and to evaluate the effects of treatment on the development of peripheral retinal vessels. Eight patients ($n = 16$ eyes) received intravitreal bevacizumab injection and laser photocoagulation, and seven patients ($n = 14$ eyes) received laser photocoagulation only. This study concluded that a combination of laser photocoagulation and intravitreal bevacizumab injection seems to be a safe and effective therapy in patients with moderate-to-severe stage 3 ROP, promulgating rapid development of peripheral retinal vessels.[45]

BEAT-ROP trial design was a prospective, multicenter, randomized, unmasked Phase II trial of intravitreal bevacizumab (0.625 mg in 0.025 ml) vs. conventional diode laser photocoagulation on 50 patients with Zone I disease and 100 patients with Zone II posterior disease. There was 1:1 randomization of bevacizumab:diode laser photocoagulation. In the bevacizumab group, recurrence of retinal neovascularization requiring treatment was 6% at 54 weeks vs. 42% in the laser group. No statistical

difference was noted for Zone II posterior, Stage 3+ROP between bevacizumab and laser. The study concluded: (1) bevacizumab is superior to laser for treatment of Zone I, Stage 3+ ROP; (2) peripheral retinal vascularization continued as normal in the bevacizumab group, but not the laser group; and (3)“Bevacizumab is an inexpensive drug that can be rapidly administered at the bedside by any ophthalmologist.[46]

Caroline R. Baumal et al conducted a prospective study on 8eyes of 4 infants, who were treated with primary 0.2mg intravitreal ranibizumab for high-risk pre-threshold or threshold posterior ROP. This study showed Intravitreal ranibizumab induces rapid, complete regression of high-risk posterior ROP with continued retina growth peripherally.[47]

A bicentered retrospective case series was done on 72eyes of 37 neonates, who had received intravitreal bevacizumab or ranibizumab as primary therapy for type 1 ROP. This study concluded that both bevacizumab and ranibizumab showed similar efficacy in the regression of ROP with minor mean refractive error at 1year of corrected age. However, high myopia was more prevalent in bevacizumab treated group.[48]

Anna R. O’Connor prospectively followed up 254 children at 10 to 12 years of age, who were premature with birth weight of 1701grams and compared with 169 children as cohort. All the children were examined for visual functions (visual acuity, contrast sensitivity, stereoacuity, perimetry, and color vision), presence of strabismus, and measurements of eye size and the dimensions of its components including refractive state. This study shows that low birth weight children are at increased risk of visual impairments compared with children who are born at full term. Visual impairments are associated with low birth weight per se and severe ROP.[49]

Parag K. Shah et al conducted a retrospective study To report the long term refractive, visual and structural outcome post-laser for zone 1 aggressive posterior retinopathy of prematurity (AP-ROP). Forty eyes of 25 infant's premature infants with zone 1 AP-ROP who underwent laser

photocoagulation from 2002 to 2007 and followed up till 2013 were included. The study showed, 94% of cases developed refractive error. Although most had a favorable anatomical and visual outcome, long-term follow-up even after a successful laser treatment in ROP is necessary.[50]

MATERIALS AND METHODS

SOURCE OF DATA

Preterm neonates born in or referred to Dayanand Medical College and Hospital, Ludhiana, Punjab were prospectively screened for ROP in NICU and followed up in department of ophthalmology OPD from November, 01 2018 to March, 31st 2020.

Design of Study- Prospective cohort

METHODS OF COLLECTION OF DATA

Inclusion Criteria

Preterm neonates with GA ≤34 weeks

Exclusion Criteria

1. Did not give consent
2. Major congenital anomaly incompatible with life

Methods (Rop Screening Procedure)

After obtaining informed written Consent by parents, detailed clinical history and risk factors for ROP were documented. The neonates were categorized in to appropriate for gestational age (AGA), small for gestational age (SGA) or large for gestational age (LGA) according to the Fenton growth chart for girls and boys.[51]

First ROP screening was performed within 2-3weeks of life by a trained ophthalmologist in NICU. The neonates were then followed up according to the Indian guideline for ROP.[52]

Pupillary dilation was done using eye drops tropicamide 0.8% and phenylephrine 0.5%. The baby was swaddled and arms restrained to minimise general movements and positioned by an assistant for the examination. Topical anesthetic drop proparacaine 0.5% was applied at conjunctiva sac. Pediatric speculum was applied 30 seconds after anesthetic drop and scleral indenter for eye rotation was used. First the anterior segment of the eye was examined to look for tunica vasculosalentis, pupillary dilation, lens and media clarity. Binocular indirect

ophthalmoscope was done using a 20D lens and scleral depression was done, when necessary, to visualize the retina till ora serrata. Retinopathy was graded based on the International Classification of ROP classification.[11]Maturity of retina, zone of retinopathy, clock hours involved, presence of plus disease and stage of ROP was documented at every visit. The neonates, who had any stage of ROP were classified into type 1 or type 2 ROP based on ETROP classification.[12]Type 1 ROP was defined as: zone 1, stage 3, without plus disease; zone 1, any-stage ROP, with plus disease; zone II, stage 2 or 3, with plus disease. All the neonates were screened either till the maturation of retinal or till complete regression of ROP according to Indian guidelines.[52]Whenever required, neonates were treated either with laser or intravitreal anti-VEGF injection.

Laser procedure: Written informed consent from the parents was obtained. Papillary dilatation was done using tropicamide 0.8% and phenylephrine0.5% 30minutes prior to the procedure. Baby was covered in warm cloths and air conditioner was reduced to prevent the possibility of hypothermia. Throughout the procedure baby was monitored with infant pulse oximater. After instillation of topical anesthesia pediatric speculum was applied into the conjunctiva sac. Frequency double green laser (532nm) was applied through an indirect ophthalmoscope and 20D lens to the peripheral avascular retina in the operation theatre by an experienced ophthalmologist and under supervision of the neonatologist. Laser parameters were titrated to get a pale white burn and varies between 100-250miliwatt of power with exposure duration of 100-200miliseconds. Approximately 3000-4000 nearly confluent burns were done per eye. The baby was followed up after 1 week to look for signs of regression or development of complication in the form of educative retinal detachment or severe ocular inflammation.

Intravitreal anti-VEGF injection (Bevacizumab 0.6mg i.e. half of the adult dose) was given under aseptic precautions in the operation theatre, when laser was not possible either due to poor papillary dilatation or poor media

clarity or in presence of APROP.

OUTCOME

Primary: Incidence of ROP and risk factors analysis

Secondary: Comparison of incidence of ROP in AGA and SGA neonates

STATISTICAL ANALYSIS

Data were described in terms of range; mean ±standard deviation (± SD), median (IQR), frequencies (number of cases) and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the study groups was done using ANOVA. For comparing categorical data, Chi square ($\chi 2$) test was performed and exact test was used when the expected frequency is less than 5.A probability value (p value) less than 0.05 was considered statistically significant. Multivariate analysis was done using Binary logistic regression. All statistical calculations were done using SPSS 21 (Statistical Package for the Social Science).

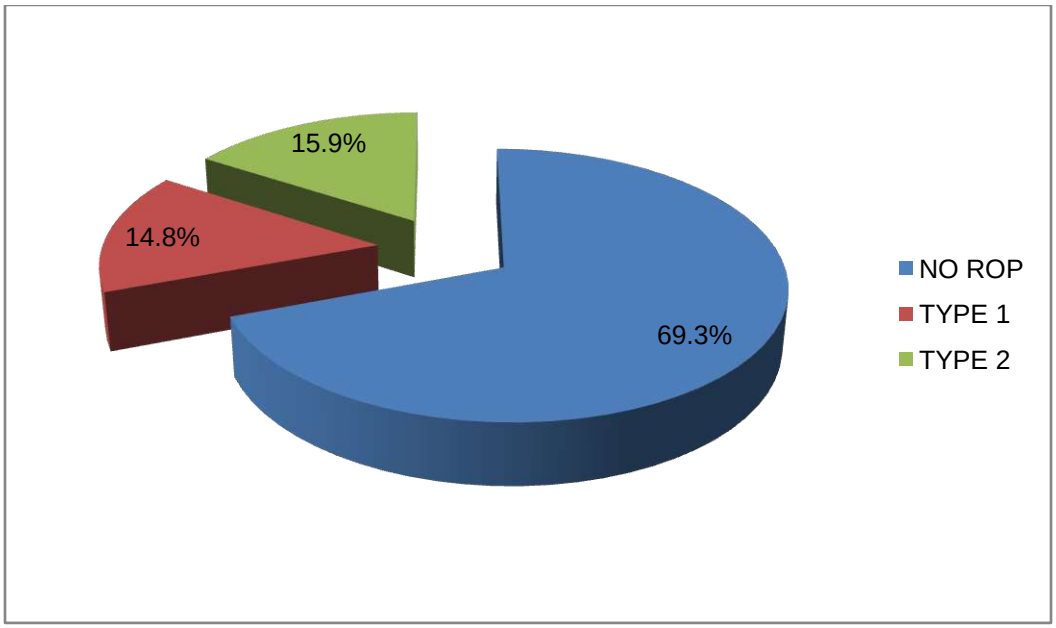
OBSERVATION AND RESULTS

This prospective study was conducted in the department of ophthalmology, Dayanand Medical College and Hospital, Ludhiana from November 2018 to March 2020. The study was undertaken to evaluate the incidence of ROP in preterm neonates of ≤34weeks of GA and to compare the incidence of ROP in AGA and SGA neonates. The study included 580 eyes of 290 neonates.

Table 1: Incidence of ROP

	No. of cases	**Percentage**
No Rop	402	69.3%
Type 1	86	14.8%
Type 2	92	15.9%
Total	580	100.0%

Figure 2: Incidence of ROP

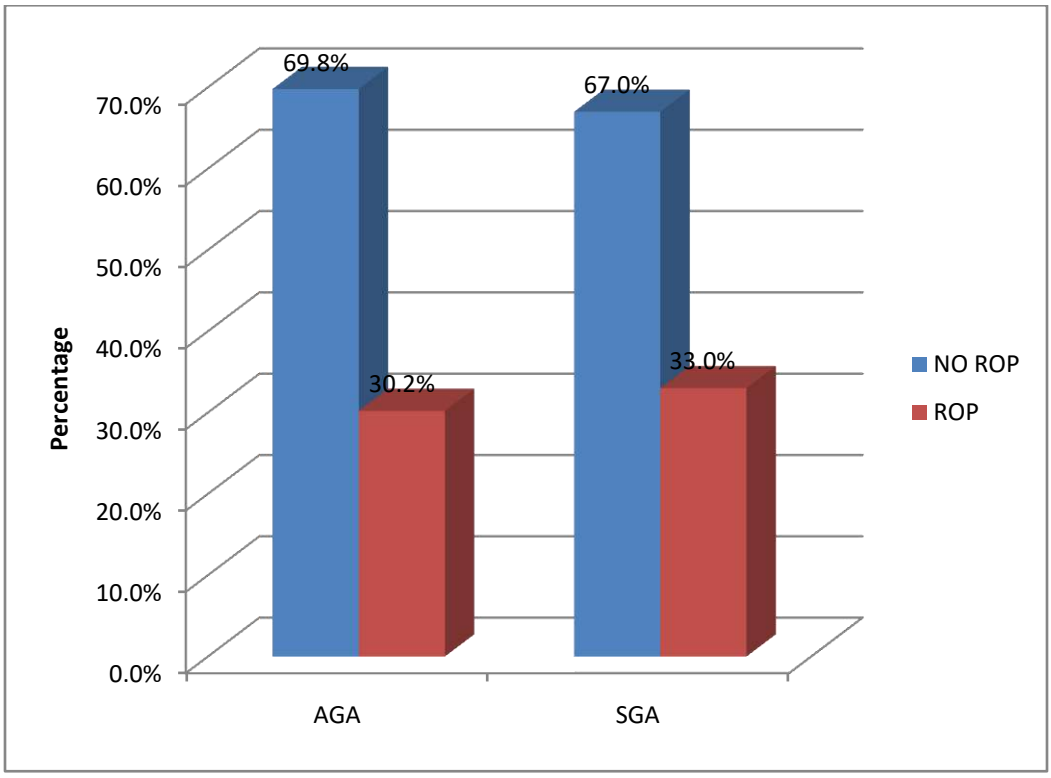


The overall incidence of any stage, Type 1 and Type 2 ROP in our study is 30.6%, 14.8% and 15.9% respectively (Table 1) (Figure 2).

Table 2: incidence of ROP in AGA and SGA

	AGA		SGA		Total	chi-square value	p-value
No Rop	335	69.8%	67	67.0%	402	1.776	0.412
Rop	145	30.2%	33	33.0%	178		

Figure 3: incidence of ROP in AGA and SGA



Incidence of any stage ROP in AGA neonates is 30.2%in comparison to 33% in SGA neonates (Table 2) (Figure 3). This difference was not found to be statistically significant (p=0.412).

Table 3: Baseline parameters

		ROP		Total
		N (%)	**Y (%)**	
SEX	F	174 (79.1%)	46 (20.9%)	220
	M	228 (63.3%)	132 (36.7%)	360
BW for GA	AGA	335 (69.8%)	145 (30.2%)	480
	SGA	67 (67.0%)	33 033.0%)	100
CONCEPTION	IVF	65 (63.7%)	37 (36.3%)	102
	NATURAL	337 (70.5%)	141 (29.5%)	478
TYPE OF PREGNANCY	SINGLETON	301 (73.8%)	107 (26.2%)	408
	TWIN	97 (63.0%)	57 (37.0%)	154
	TRIPLET	4 (22.2%)	14 (77.8%)	18

Out of 360 eyes of male neonates, 132 eyes (36.7%) developed ROP and 228 eyes (63.3%) did not develop ROP.Out of 220 eyes of female neonates 46 eyes (20.9%) developed ROP, whereas 174 eyes (79.1%) did not. Out of 580 eyes, 480 eyes were of AGA neonates and 100 eyes were of SGA neonates. 145 eyes (30.2%) in AGA and 33 eyes (33.0%) in SGA neonates developed ROP. 37 eyes (36.3%) of IVF conceived and 141 eyes (29.5%) of naturally conceived neonates developed ROP. 107 eyes (26.2%), 57 eyes (37.0%) and 14 eyes (77.8%) of singleton, twin and triplet pregnancy developed ROP respectively (Table 3).

TABLE 4 : Baseline parameters : Neonatal risk factors

		ROP		Total
		N (%)	Y (%)	
RDS	NO	36 78.3%	10 21.7%	46
	YES	366 68.5%	168 31.5%	534
SURFACTANT	NO	357 75.3%	117 24.7%	474
	YES	45 42.5%	61 57.5%	106
OXYGEN	NO	42 (88.57%)	6 11.5%	52
	YES	356 67.4%	172 32.6%	528
FETAL DISTRESS	NO	360 69.2%	160 30.8%	520
	YES	42 70.0%	18 30.0%	60
NNH	NO	145 73.2%	53 26.8%	198
	YES	257 67.3%	125 32.7%	382
PHOTOTHERAPY	NO	144 74.2%	50 25.8%	194
	YES	258 66.8%	128 33.2%	386
DIABETES	NO	400 69.2%	178 30.8%	578

	YES	2 100.0%	0 0.0%	2
HTN	NO	392 68.8%	178 31.2%	570
	YES	10 100.0%	0 0.0%	10
IVH	NO	402 69.3%	178 30.7%	580
SEPSIS	NO	273 75.4%	89 24.6%	362
	YES	129 59.2%	89 40.8%	218
ANAEMIA	NO	390 72.0%	152 28.0%	542
	YES	12 31.6%	26 68.4%	38
BLOOD TRANSFUSION	NO	394 69.6%	172 30.4%	566
	YES	8 57.1%	6 42.9%	14
PDA	NO	391 70.3%	165 29.7%	556
	YES	11 45.8%	13 54.2%	24
SEIZURE	NO	402 69.3%	178 30.7%	580

TABLE 5: Baseline parameters: Maternal risk factors

		ROP		Total
		N (%)	Y (%)	
PIH	NO	300 73.5%	108 26.5%	408
	YES	102 59.3%	70 40.7%	172
GDM	NO	390 68.9%	176 31.1%	566
	YES	12 85.7%	2 14.3%	14
RDF	NO	390 69.6%	170 30.4%	560
	YES	12 60.0%	8 40.0%	20

70 eyes (40.7%) of neonates whose mother had PIH and 108 eyes (26.5%) of neonates whose mother did not have PIH developed ROP. 176 eyes (31.1%) with a maternal history of GDM did not develop ROP. 170 eyes (30.4%) developed ROP without any antenatal history of RDF and 8 eyes (40.4%) developed ROP with an antenatal history of RDF (Table 5).

Table 6: Mean GA and BW

	ROP	N	Mean	Std. Deviation	t	p-value
GA	Yes	178	30.13	2.220	-10.216	0.0001
	No	402	31.98	1.916		
BIRTH WEIGHT	Yes	178	1292.79	317.656	-9.625	0.001
	No	402	1607.31	381.263		

Figure 4(i): distribution of mean GA in ROP and NO-ROP neonates

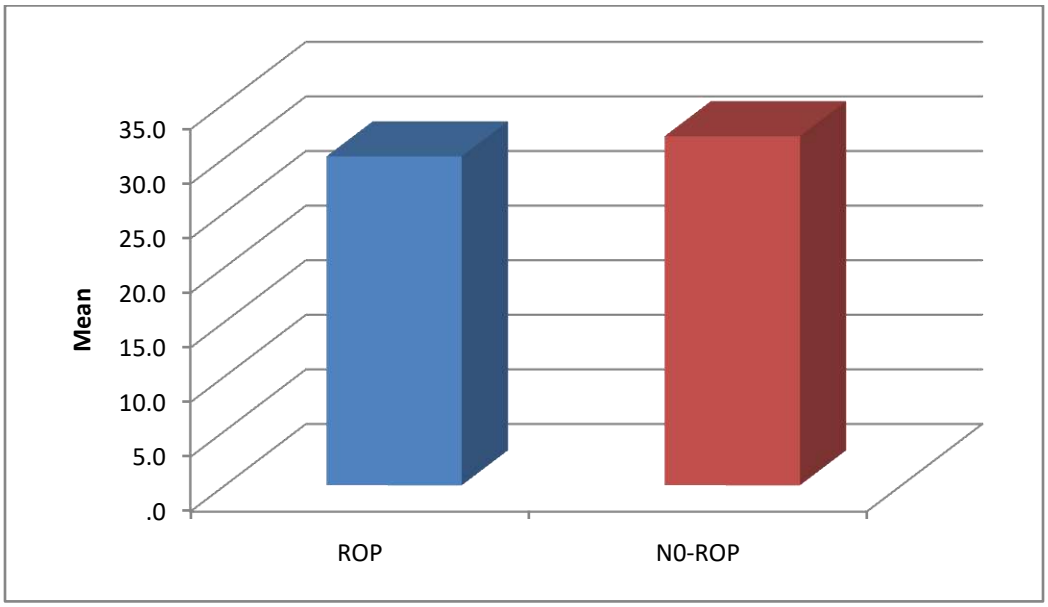
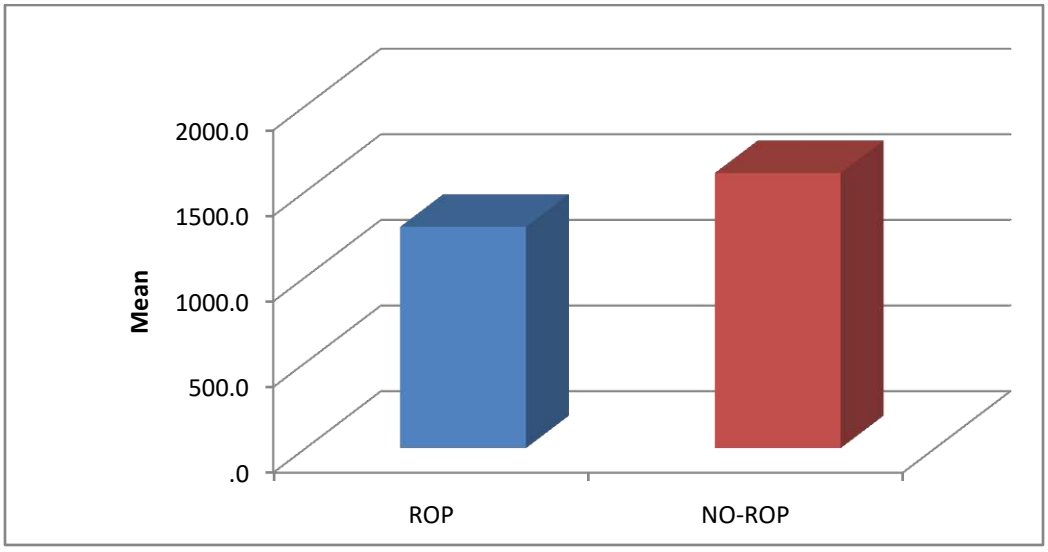


Figure 4(ii): distribution of mean BW in ROP and NO-ROP neonates



The mean GA of neonates with ROP and without ROP was 30.13±2.2wks and 31.98±1.91wks respectively (Figure 4(i)). The mean BW of neonates with ROP and without ROP was 1292.79±317.65gm and 1607±381.263gms respectively (Figure 4(ii)). There was a statistically significant correlation between incidence of ROP and GA (P=0.0001) and BW (P=0.001) (Table 6).

Table 7: Univariate analysis of risk factors

		ROP		Total	chi-square value	p-value
		N	Y			
Sex	F	174 79.1%	46 20.9%	220	15.94	0.0001
	M	228 63.3%	132 36.7%	360		
BW	AGA	335 69.8%	145 30.2%	480	0.303	0.582
	SGA	67 67.0%	33 33.0%	100		
Conception	IVF	65 63.7%	37 36.3%	102	1.815	0.178
	NATURAL	337 70.5%	141 29.5%	478		
Type of pregnancy	SINGLETON	301 73.8%	107 26.2%	408	25.480	0.0001
	TWIN	97 63.0%	57 37.0%	154		
	TRIPLET	4 22.2%	14 77.8%	18		
RDS	NO	36 78.3%	10 21.7%	46	1.882	0.170
	YES	366 68.5%	168 31.5%	534		
NNH	NO	145 73.2%	53 26.8%	198	2.174	0.140
	YES	257 67.3%	125 32.7%	382		

Anaemia	NO	390 72.0%	152 28.0%	542	27.216	0.000
	YES	12 31.6%	26 68.4%	38		
Diabetes	NO	400 69.2%	178 30.8%	578	0.889	0.346
	YES	2 100.0%	0 0.0%	2		
Surfactant	NO	357 75.3%	117 24.7%	474	43.984	0.001
	YES	45 42.5%	61 57.5%	106		
Sepsis	NO	273 75.4%	89 24.6%	362	16.870	0.001
	YES	129 59.2%	89 40.8%	218		
Seizure	NO	402 69.3%	178 30.7%	580		
HTN	NO	392 68.8%	178 31.2%	570	4.506	0.036
	YES	10 100.0%	0 0.0%	10		
IVH	NO	402 69.3%	178 30.7%	580		
Oxygen	NO	42 (88.57 %)	6 (11.5 %)	52	9.849	0.001
	YES	356 (67.4%)	172 (32.6 %)	528		
Fetal distress	NO	360 69.2%	160 30.8%	520	0.015	0.903

	YES	42 70.0%	18 30.0%	60		
Blood transfusion	NO	394 69.6%	172 30.4%	566	0.999	0.318
	YES	8 57.1%	6 42.9%	14		
PDA	NO	391 70.3%	165 29.7%	556	6.487	0.011
	YES	11 45.8%	13 54.2%	24		
Phototherapy	NO	144 74.2%	50 25.8%	194	3.313	0.069
	YES	258 66.8%	128 33.2%	386		
PIH	NO	300 73.5%	108 26.5%	408	11.513	0.001
	YES	102 59.3%	70 40.7%	172		
GDM	NO	390 68.9%	176 31.1%	566	1.815	0.178
	YES	12 85.7%	2 14.3%	14		
RDS	NO	390 69.6%	170 30.4%	560	0.844	0.358
	YES	12 60.0%	8 40.0%	20		
Maternal anaemia	NO	390 69.1%	174 30.9%	564	0.250	0.617
	YES	12 75.0%	4 25.0%	16		
Total		402 69.3%	178 30.7%	580		

On univariate analysis of all the risk factors male gender (p=0.00), neonatal anaemia (p=0.00), oxygen administration (p=0.001), surfactant administration (p=0.001), sepsis (p=0.001), PDA (p=0.017), Neonatal hypertension (0.03) and phototherapy (p=0.034) were found to be significantly correlated with ROP.

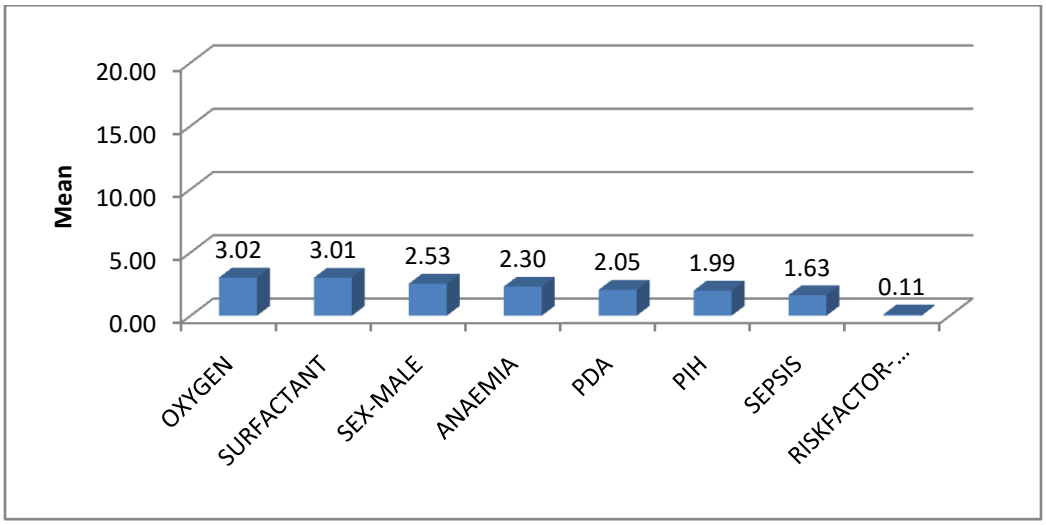
Of the maternal factors, multiple pregnancy ((p=0.00) and PIH (p=0.002) were found to be significantly correlated with ROP.

SGA, mode of conception, RDS, NNH, neonatal diabetes, IVH, foetal distress, GDM, RDF and maternal anaemia were not found to be significantly correlated with incidence of ROP (Table 7).

Table 8: Multivariate analysis of the risk factors

	p-value	**Exp(B)**	**95% C.I.for EXP(B)**	
			Lower	**Upper**
Oxygen	0.019	3.02	1.203	7.584
Surfactant	0.000	3.01	1.832	4.934
Sex-male	0.000	2.53	1.638	3.919
Anaemia	0.042	2.30	1.031	5.141
Pda	0.135	2.05	0.800	5.265
Pih	0.002	1.99	1.296	3.048
Sepsis	0.021	1.63	1.078	2.453
Riskfactor-twin	0.000	0.11	0.031	0.361
Riskfactor-triplet	0.000	0.07	0.022	0.239

Figure 5: Multivariate analysis of the risk factors

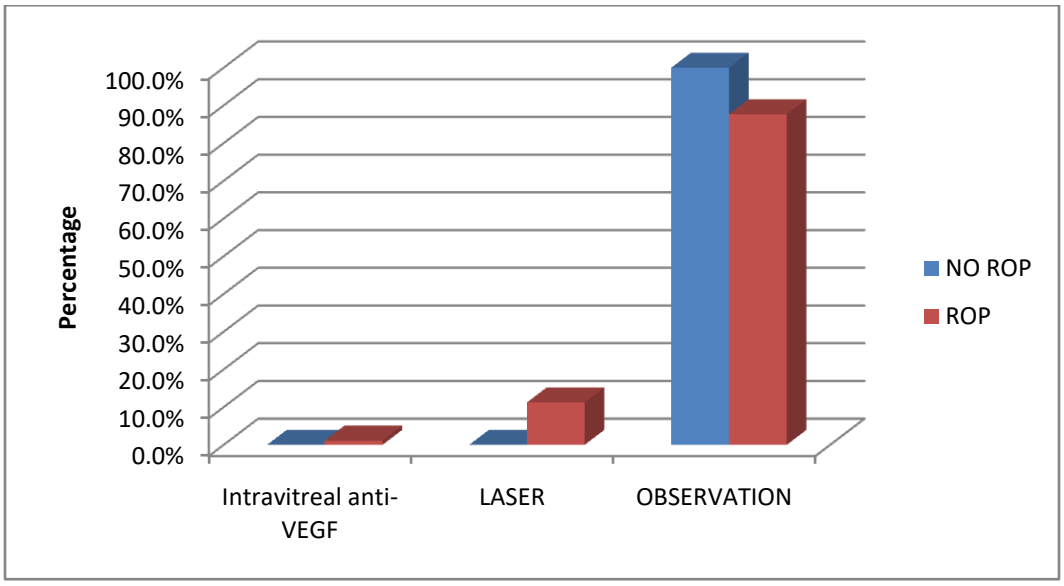


Multivariate analysis of risk factors showed male gender (OR=2.47; CI=95%), neonatal anaemia (OR=2.3; CI=95%), oxygen administration (OR=3.02; CI=95%), surfactant administration (OR=3.01; CI=95%), sepsis(OR=1.63; CI=95%), PDA (OR=2.05; CI=95%), Triplet pregnancy (OD= 0.07; CI=95%), Twin pregnancy (OR=0.11; CI=95%)and PIH (p=1.99; CI=95%) as independent risk factors for ROP (Table 8) (figure 5).

Table 9: Management of ROP

MANAGEMENT	**ROP**				**Total**
	N		**Y**		
Intravitreal anti-VEGF	0	0.0%	2	1.12%	2
Laser	0	0.0%	20	11.24%	20
Observation	402	100.0%	156	87.64%	558

Figure 6: Management of ROP



Out of 178 eyes with ROP, 156 eyes resolved spontaneously. Two eyes received single dose of intra vitreal anti-VEGF (avastin 0.6mg), whereas 20 eyes required laser treatment (Table 09) (Figure6). None of the eyes developed treatment related complication.

Table 10: Mean GA and BW among treatment and observation group

		N	Mean	Std. Deviation	t	p-value
GA	Treatment	22	30.56	2.416	3.061	0.003
	Observation	67	28.94	2.061		
BIRTH WEIGHT	Treatment	22	1346.36	223.863	3.419	0.001
	Observation	67	1123.48	277.169		

Figure 7(i): Mean GA in treated neonates

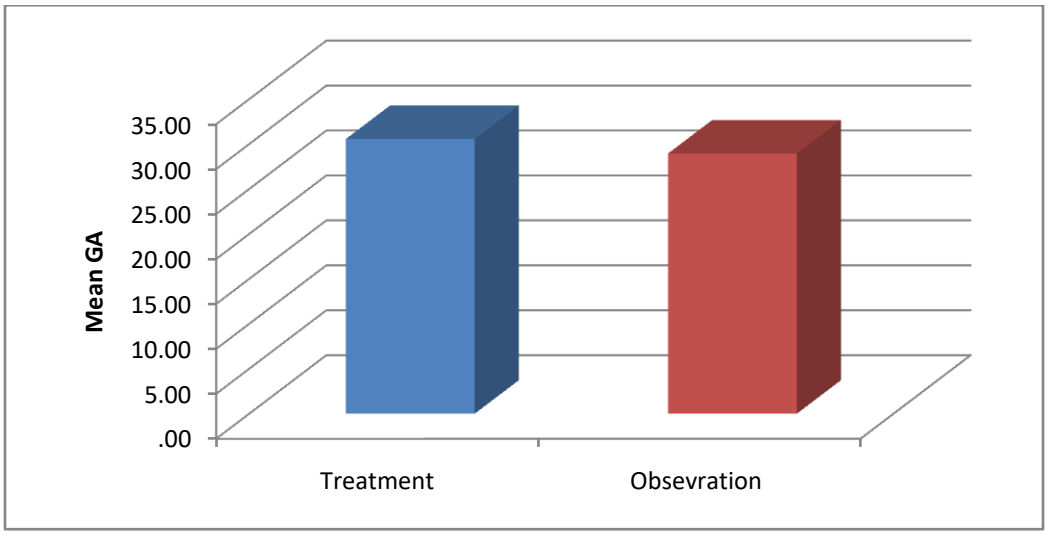
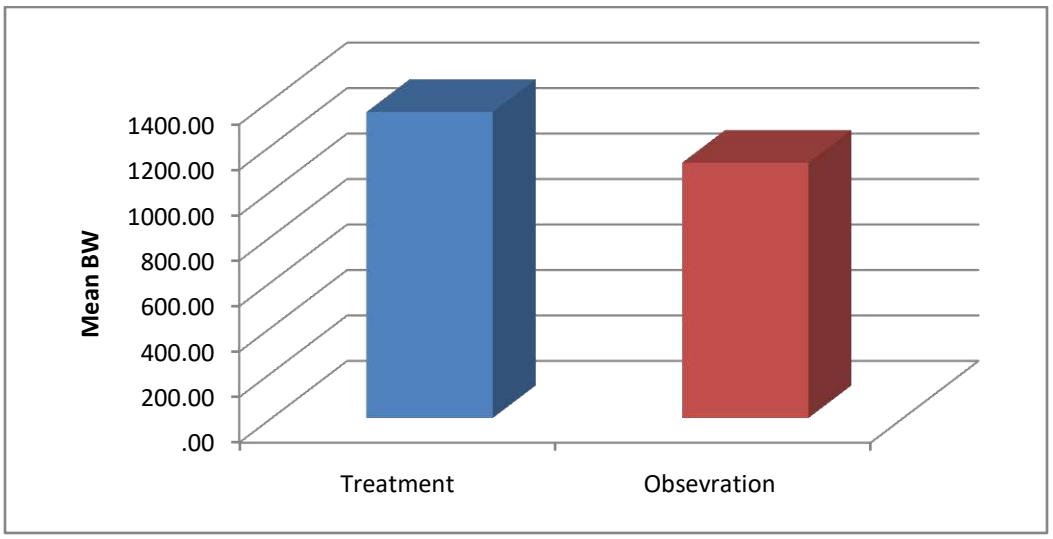


Figure 7(ii): mean BW in treated neonates



Mean BW and GA of neonates, who required treatment for ROP was 1346.36±223.86gm and 30.56±2.42wks respectively, which is higher from the neonates who did not require any treatment and resolved spontaneously (mean BW 1123.48±277gms and GA 28.94±2.0wks) (Table 10) (Figure 7(i),7(ii).

DISCUSSION

The present study was conducted on 290 preterm neonates with gestation age ≤34weeksat Dayanand medical college and hospital over a period of 15months (November 2018 to March 2020), to assess the incidence of ROP.The inclusion criteria in our study was based on the national guidelines for ROP screening followed in India, which is similar to the studies by Imren A et al, Ratheesh Ret al and RajashekarD et al[28,34,35,52]. Whereas, studies by Prendiville et al, Palmer et al and Fortes Filho et al had smaller GA and BW as their inclusion criteria[14,18,19]. Observations from various studies have shown development of sight-threatening ROP in more mature infants in settings where levels of neonatal care are suboptimal.[7] Thus, ROP screening criteria differ between the developed and developing countries.[57]

In our study, the overall incidence of any stage, Type 1 and Type 2 ROP was 30.6%, 14.8% and 15.9% respectively, which is similar to the studies done by Fortes Filho JB et al and Kavurt Set al [14,15,35]. But there are a few studies which had a higher incidence of ROP in comparison to our study [5,38,39,53]. Early treatment for Retinopathy of prematurity study (ETROP) showed the incidence of any stage ROP and severe ROP to be 68% and 36.9% respectively[58] This decrease in incidence of ROP in our study in comparison to ETROP study and other studies could be due to more identification and prevention of the known risk factors for ROP and an improvement in the neonatal care in our centre. In our study, the overall incidence of ROP in AGA and SGA group was 30.2% and 33% respectively, which is similar to the study by Fortes Filho et al[14]. Incidence of ROP was higher in SGA group in our study, though statistically not significant, which is similar to the study by Imren A et al (AGA- 41.2%; SGA- 45.9%)[34]. On the contrary, studies by Raj R et al (AGA: 40%; SGA: 25.8%) showed a lesser incidence of ROP in SGA group in comparison to AGA group.[28]

These variations in the incidence of ROP could be due to the different inclusion criteria for the study population, mortality rate and due to improvement in the neonatal care leading to increased survival of preterm neonates.

In our study, treatment was required in only 3.7% of total neonates screened. In contrast to this, 6.2% cases required treatment in study by AlajbegovicHalimicJ et al.[29]In this study, only one eye (0.1%) developed blinding disease in the form of falciform ligament as it lost to follow up for one and half year.

ROP is a multifactorial disease of the developing retina. Till now various risk factors have been studied in relation to the ROP among which GA and BW are the most important one[34,55,56]. Our study also showed a significant relationship of GA (p=0.006) and BW (p=0.001) with the incidence of ROP. SGA was not proven to be an independent risk factor for ROP in our study (p=0.5), similar to the studies by Fortes Filho JB et al (p = 0.1) and Manohar Sai Kothuri et al (p = 0.4).[14,27]Whereas, there are few studies which showed SGA as an independent risk factor for ROP[17,28,54].

On univariate analysis male gender (p=0.00), neonatal anaemia (p=0.00), oxygen administration (p=0.001), surfactant administration (p=0.001), sepsis (p=0.001), neonatal hypertension (p=0.03), PDA (p=0.017), multiple pregnancy ((p=0.00) and PIH (p=0.0001) were found to be significantly correlated with ROP. After logistic regression multivariate analysis showed male gender (OR=2.47; CI=95%), neonatal anaemia (OR=2.3; CI=95%), oxygen administration (OR=3.02; CI=95%), surfactant administration (OR=3.01; CI=95%), sepsis (OR=1.63; CI=95%), PDA (OR=2.05; CI=95%), Triplet pregnancy (OD= 0.07; CI=95%), Twin pregnancy (OR=0.11; CI=95%) and PIH (p=1.99; CI=95%) as an independent risk factors for ROP.

In contrary to the studies by AI-Qahtani B et al,Kothuri M et al, Dyaberi R et al, our study showed a significant correlation between male gender and incidence of ROP[27,35,54].

Similar to the study by Rohit Kapoor et al, our study also showed a significant correlation between multiple pregnancy, PIH and incidence of ROP[39]. Our study also showed a high odds ratio for triplet pregnancy and that could be because of the small sample size (n=9) . Whereas, there are few studies which did not show any significant correlation between incidence of ROP and multiple pregnancy.[27,35,54]

Similar to our study, other studies have also proven oxygen supplementation to be a significant risk factor for ROP.[5,24,25,54]

Studies by Alajbegovic-Halilovic J et al, Haggins RD et al and Patel P showed RDS as an independent risk factor for ROP, whereas our study did not show the same.[23,29,53]

In agreement with the study by Raj R et al, our study also showed surfactant administration as an independent risk factor for ROP[28]. Whereas, study by AI-Qahtani B et al did not show any significant correlation between ROP and surfactant administration.[54]

Similar to our study sepsis was an independent risk factor for ROP in studies by VP Gupta et al, Patel P et al and KavurtS et al.[15,24,53] Whereas, studies by AI-Qahtani B et al and Alajbegovic-Halilovic J et al did not show any significant correlation between sepsis and ROP.[29,54]

Our study and study by Haggins RD et al and Kavurt S et al showed PDA as a significant risk factor for ROP.[15,23]

None of the neonates in our study developed Intraventricular haemorrhage (IVH).

On contrary to, study by R Maheshwari et al, Chawla D et al and Kapoor R et al, our study showed a significant correlation between incidence of ROP and blood transfusion.[25,39,59]

Compatible group's and prospective nature are the strength of our study. But, there were few limitations in our study too. As the study was conducted in one centre and on a small population, the results cannot be extrapolated for the general population. So we suggest more studies on larger population to evaluate the risk factors and incidence of ROP.

SUMMARY AND CONCLUSION

ROP is a disorder of premature retina and caused by abnormal development of retinal blood vessels. This prospective cohort study was conducted at Dayanand medical college and hospital over a period of 15months to evaluate the incidence of ROP and associated risk factors. The study included 290 preterm neonates with GA $\leq$34wks and $\leq$ 2000gms. Neonates were divided into AGA or SGA groups based on Fenton growth charts. All neonates underwent ROP screening by an experienced ophthalmologist either till maturation of retina or complete regression of ROP. ROP was classified based on ICROP classification. Treatment was administered whenever required in the form of laser or intravitreal anti-VEGF injection. The following results were obtained-

1. 290 neonates were screened. 240(82.8%) were AGA and 50(17.2%) were SGA.
2. The mean birth weight and gestational age was 1510.79$\pm$390.977 gm and 31.4$\pm$4.8 weeks respectively.
3. The overall incidence of any stage, Type 1 and Type 2 ROP in our study is 30.6%, 14.8% and 15.9% respectively.
4. Incidence of any stage ROP in AGA neonates is 43.2%in comparison to 44.2%in SGA neonates respectively.
5. Out of 178 eyes with ROP, 156 eyes resolved spontaneously. Two eyes received single dose of anti-VEGF (avastin 0.6mg), whereas 20 eyes required laser treatment. None of the eyes developed treatment related complication.
6. On univariate analysis male gender (p=0.00), NNH (p=0.04), neonatal anaemia (p=0.001), oxygen administration (p=0.001), surfactant administration (p=0.0001), sepsis (p=0.001), blood transfusion (p=0.006), PDA (p=0.017), photo therapy (p=0.034) were found to be significantly correlated with ROP.

7. Maternal factors like multiple pregnancy ((p=0.00), PIH (p=0.002), reversal of diastolic flow (p=0.002) were also found to be significantly correlated with ROP.
8. SGA, mode of conception, RDS, neonatal diabetes, neonatal hypertension, IVH, foetal distress, GDM and maternal anaemia were not found to be correlated with incidence of ROP.
9. Multivariate analysis of risk factors showed male gender (OR=2.47), neonatal anaemia (OR=2.3), oxygen administration (OR=3.02), surfactant administration (OR=3.01), sepsis (OR=1.63;), PDA (OR=2.05), Triplet pregnancy (OD= 0.07), Twin pregnancy (OR=0.11) and PIH (p=1.99) as independent risk factors for ROP as independent risk factors for ROP.

Conclusion: This study showed that both AGA and SGA premature infants have similar incidence of ROP. Low BW and GA are the significant risk factors for any stage ROP.

LIST OF REFERENCES

1. Vanderveen DK, Zupancic JAF. Retinopathy of Prematurity. 6th ed. In: Cloherty JP, Eichenwald EC, Stark AR, eds.Manual of neonatal care. Philadelphia, PA: Lippincott Williams & Wilkins; 2010 p. 640-4.
2. Singh M. Miscellaneous conditions: Retinopathy of prematurity 7th ed. In: Care of the newborn. New Delhi: Sagar Publications; 2010. p. 425-42.
3. Lee TC, Chiang MF. Pediatric Retinal vascular Diseases. In: Ryan SJ, Sadda SR, Hinton DR, Schachat AP, Wilkinson CP, Wiedemann P, (editors). Retina.1165-87.
4. Chaudhari S, Patwardhan V, Vaidya U, Kadam S, Kamat A. Retinopathy of prematurity in a tertiarycarecenter–incidence,riskfactorsandoutcome.IndianPediatr. 2009;46:219-224.
5. Rekha S, Battu RR. Retinopathy of prematurity incidence and risk factors. Indian Pediatr. 1996;33:999-1003.
6. Maini B,Chellani H,Arya S. Retinopathy of Prenaturity : Risk factorand role of antenatal betamethasone in indian preterm newborn babies. J Clin Neonatol. 2014;3:20-4.
7. Gilbert C, Fielder A, Gordillo L, Quinn G, Semiglia R, VisintinP, et al. Characteristics of infants with severe ROP in countries with low moderate and high levels of development, implications of screening programmes. Pediatrics. 2005;115:515-8.
8. Gilbert C, Rahi J, Eckstein M, Osullivan J, Foster A. Retinopathy of prematurity.Lancet. 1997;350:12-14
9. Gergly K, Gerinec A. Retinopathy of prematurity- epidemics, incidence, prevalence, blindness. BratislLecListy. 2010;111:514-7
10. Chawla D, Agarwal R, Deorari A, Paul VK, Chandra P, Azad RV. Retinopathy of prematurity.In: AIIMS NICU protocols.

11. The international classifications of retinopathy of prematurity revisited. Arch Ophthalmol. 2005;123:991-9.
12. Early Treatment for Retinopathy of Prematurity Cooperative Group. Revised indications for treatment of retinopathy of prematurity: results of the early treatment for retinopathy of prematurity randomized trial. Arch Ophthalmol 2003;121:1684–96
13. Quinn GE, Dobson V, Repka MX, Reynold J, Kivlin J, Davis B, et al. The Cryotherapy for retinopathy of prematurity cooperative group. Development of myopia in infants with birth weights less than 1251 grams. Opthalmology. 1992;99:329-40.
14. Fortes Filho JB, Valiatti FB, Eckert GU, Costa MC, Silveira RC, Procianoy RS, et al. Is being small for gestational age a risk factor for retinopathy of prematurity? A study with 345 very low birth weight preterm infants. J Pediatr (Rio J). 2009;85:48-54.
15. Kavurt S, Ozcan B, Aydemir O, Bas, A.Y. and Demire N. Risk of Retinopathy of prematurity in small for gestational age premature infants. Indian pediatrics.1;51:803-6
16. Dhaliwal CA, Fleck BW, Wright E, Graham C, McIntosh N. Retinopathy of prematurity in small-for-gestational age infants compared with those of appropriate size for gestational age. Archives in disease in childhood-fetal and neonatal edition.1;94:193-5.
17. Bardin C, Zelkowitz P, Papageorgiou A. Outcome of small-for-gestational age and appropriate-for-gestational age infants born before 27 weeks of gestation. Pediatrics 1997;100:E4.
18. Prendiville A, Schulenburg WE. Clinical factors associated with retinopathy of prematurity. Arch Dis Child.1988;63:522-7.
19. Palmer EA, Flynn JT, Hardy RJ, Phelps DL, Phillips CL, Schaffer DB, et al. The Cryotherapy for Retinopathy of Prematurity Cooperative Group. Incidence and early course of retinopathy of prematurity. Ophthalmology 1991;98:1628-40.

20. Flynn JT, Bancalari E, Snyder ES, Goldberg RN, Feuer W, Cassady J, et al. A cohort study of transcutaneous oxygen tension and the incidence and severity of retinopathy of prematurity. N Engl J Med. 1992;326:1050-4.
21. Mittal M, Dhanireddy R, Higgins RD. Candida sepsis and association with retinopathy of prematurity. Pediatrics. 1998;101:654-7.
22. Charan R, Dogra MR, Gupta A, Narang A. The incidence of retinopathy of prematurity in a neonatal care unit. Ophthalmology.1995;43:123-6.
23. Higgins RD, Mendelsohn AL, DeFeo MJ, Ucsel R, Hendricks-Munoz KD. Antenatal dexamethasone and decreased severity of ROP. Arch Ophthalmol. 1998;116:601-605.
24. Gupta VP, Dhaliwal U, Sharma R, Gupta P, Rohatgi J. Retinopathy of prematurity –risk factors. Indian J Pediatr. 2004;71:887-92.
25. Chawla D, Agarwal R, Deorari AK, Paul VK. Retinopathy of prematurity. Indian J Pediatr. 2008;75:73-6.
26. Austeng D, Källen KB, Ewald UW, Jakobsson PG, Holmström GE. Incidence of retinopathy of prematurity in infants born before 27 weeks' gestation in Sweden. Arch Ophthalmol. 2009;127:1315-9.
27. Kothuri M, Malshe N, Lalwani S. A prospective observational study of retinopathy of prematurity in a tertiary care centre with respect to its incidence, risk factors and short term outcomes. Sri Lanka Journal of Child Health. 1;46:343-52.
28. Raj R, Latha NV, Asha AV, George TA, Jacob S, Praveena KK. A comparative study of the incidence of retinopathy of prematurity between small-for-gestational-age and appropriate-for-gestational-age preterm babies in North Kerala. Kerala Journal of Ophthalmology. 1;29:197.
29. Alajbegovic-Halimic J, Zvizdic D, Alimanovic-Halilovic E, Dodik I, Duvnjak S. Risk factors for retinopathy of prematurity in premature born children. Medical Archives. 10;6:409.

30. Yau GS, Lee JW, Tam VT, Yip S, Cheng E, Liu CC, Chu BC, Wong IY. Incidence and risk factors for retinopathy of prematurity in multiple gestations: a Chinese population study. Medicine 94.18
31. dos Santos Motta, Mário Martins, et al. "Multiple pregnancies and its relationship with the development of retinopathy of prematurity (ROP)." Clinical Ophthalmology (Auckland, NZ) 5:1783.
32. Friling, Ronit, et al. "Retinopathy of prematurity in multiple-gestation, very low birth weight infants." Journal of pediatric ophthalmology and strabismus 34.2:96-99.
33. Abdel, Hakeem AHA, G. B. Mohamed, and M. F. Othman. "Retinopathy of prematurity: a study of incidence and risk factors in NICU of Al-Minya University Hospital in Egypt." Journal of clinical neonatology 1.2:76.
34. Akkoyun, Imren, et al. "Risk factors in the development of mild and severe retinopathy of prematurity." Journal of American Association for Pediatric Ophthalmology and Strabismus 10.5:449-453..
35. Dyaberi, Rajashekar, Udaysridhar Mulgund, and Rupesh Rakhonde. "Analysis of Retinopathy of Prematurity in a Tertiary Care Hospital." Ophthalmology Research: An International Journal 1-7.
36. Paranjpe, Gaurav, Renuka Sarwate, and Neha Shetty. "Risk factor and Outcome of Retinopathy of Prematurity among Premature Babies admitted to Tertiary Care Hospital: A Retrospective Observational Study." Journal of Current Medical Research and Opinion 2.11:334-338.
37. Maini, Baljeet,. "Retinopathy of prematurity: risk factors and role of antenatal betamethasone in Indian preterm newborn babies." *Journal of Clinical Neonatology* 3.1:20.
38. Shetty SP, Shetty J, Amin H, Shenoy RD. The incidence, risk factors and outcome of retinopathy of prematurity at a tertiary care centre in south India. J Dent Med Sci. 2015;14:77-83.

39. Kapoor R, Talwar R, Sachdeva S, Paul P, Yadav R, Sachdeva S. Retinopathy of prematurity in babies weighing< 1800 g; with special reference to babies weighing between 1501 and 1800 g: An experience from a tertiary care hospital in Delhi. International Journal of Medicine and Public Health. 2014;4.
40. Mohamed S, Murray JC, Dagle JM, Colaizy T. Hyperglycemia as a risk factor for the development of retinopathy of prematurity. BMC pediatrics 13.1: 1-5.
41. Cryotherapy for Retinopathy of Prematurity Cooperative Group. "Multicenter trial of cryotherapy for retinopathy of prematurity: one-year outcome: structure and function." Arch Ophthalmol 108:1408-1416.
42. Cryotherapy for Retinopathy of Prematurity Cooperative Group. "Multicenter trial of cryotherapy for retinopathy of prematurity: one-year outcome: structure and function." Arch Ophthalmol 108:1408-1416.
43. Lira, Rodrigo Pessoa Cavalcanti, et al. "Efficacy and safety of green laser photocoagulation for threshold retinopathy of prematurity." Arquivos brasileiros de oftalmologia 71.1:49-51.
44. McNamara, J. Arch. "Laser photocoagulation for stage 3+ retinopathy of prematurity." Ophthalmology 98.5:576-580.
45. Lee JY, Chae JB, Yang SJ, Yoon YH, Kim JG. Effects of intravitreal bevacizumab and laser in retinopathy of prematurity therapy on the development of peripheral retinal vessels. Graefe's Archive for Clinical and Experimental Ophthalmology 248.9:1257-1262.
46. Moshfeghi, Darius M., and Audina M. Berrocal. "Retinopathy of prematurity in the time of bevacizumab: incorporating the BEAT-ROP results into clinical practice." Ophthalmology 118.7:1227-1228.
47. Baumal, Caroline R., Roger A. Goldberg, and Jordana G. Fein. "Primary intravitreal ranibizumab for high-risk retinopathy of

prematurity." Ophthalmic Surgery, Lasers and Imaging Retina 46.4: 432-438.

48. Chen, S. N., Lian, I., Hwang, Y. C., Chen, Y. H., Chang, Y. C., Lee, K. H.,& Wu, W. C. Intravitreal anti-vascular endothelial growth factor treatment for retinopathy of prematurity: comparison between ranibizumab and bevacizumab. Retina, 35.4:667-674.
49. O'Connor, A. R., Stephenson, T., Johnson, A., Tobin, M. J., Moseley, M. J., Ratib, S.& Fielder, A. R. Long-term ophthalmic outcome of low birth weight children with and without retinopathy of prematurity. Pediatrics, 109.1:12-18.
50. Shah, Parag K. "Long term refractive and structural outcome following laser treatment for zone 1 aggressive posterior retinopathy of prematurity." Oman Journal of Ophthalmology 7.3:116.
51. Fenton, Tanis R., and Jae H. Kim. "A systematic review and meta-analysis to revise the Fenton growth chart for preterm infants." BMC pediatrics 13.1:59.
52. Shukla, Rajan, et al. "Operational guidelines for ROP in India: A Summary." Indian Journal of Ophthalmology 68.1:108.
53. Patel P. Screening for retinopathy of prematurity in neonates. International Journal of Research in Medical Sciences. 99,807-811.
54. Al-Qahtani, Bader, et al. "Retinopathy of Prematurity Incidence and Risk Factors in a Tertiary Hospital in Riyadh, Saudi Arabia." Middle East African Journal of Ophthalmology 26.4:235.
55. Kim TI, Sohn J, Pi SY, Yoon YH. Postnatal risk factors of retinopathy of prematurity. Paediatr Perinat Epidemiol. 18.2:130-134.
56. Dammann O, Brinkhaus MJ, Bartels DB, Dördelmann M, Dressler F, Kerk J, et al. Immaturity, perinatal inflammation, and retinopathy of prematurity: A multi-hit hypothesis. Early human development 85.5: 325-329.
57. Gilbert, Clare E. "Screening for retinopathy of prematurity: does one size fit all?." F280-F281.

58. Early Treatment for Retinopathy of Prematurity Cooperative Group. The incidence and course of retinopathy of prematurity: findings from the early treatment for retinopathy of prematurity study. Pediatrics. 116.1:15-23.
59. ARI RM KH, Paul VK, Singh M, Deorari AK, Tiwari HK. Incidence and risk factors of retinopathy of prematurity in a tertiary care newborn unit in New Delhi. Natl Med J India. 1996;9:211.

SR. NO	NAME	MRD NO	MOTHER'S AGE	DOB	DOE	GA	BIRTH WEIGHT	SEX	BIRTH WEIGHT FOR GESTATIONAL AGE	CONCEPTION	RISK FACTOR	RDS	NNH	ANAEMIA	DIABETES	SURFACTANT	SEPSIS	SEIZURE	HTN	IVH
1	B/O A..	614026	30	03-11-2018	01-12-2018	31.1	1460	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
2	B/O S..	614335	34	03-11-2018	15-11-2019	33	1900	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
3	B/ V..	616489	27	09-11-2018	07-05-2019	30.4	1760	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
4	B/O B..	620366	30	15-11-2018	18-01-2019	29.6	1080	M	AGA	IVF	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
5	EK ..	640234	27	15-11-2018	25-06-2019	29.2	1280	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
6	B/O S..	620732	31	16-11-2018	10-12-2018	34	1850	M	AGA	NATURAL	SINGLETON	YES	NO	NO	YES	NO	NO	NO	NO	NO
7	B/O S..	620732	31	16-11-2018	29-11-2018	34	1850	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
8	B/O J..	622166	33	19-11-2018	08-02-2019	32	2000	M	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
9	B/O R..	625173	32	23-11-2018	16-07-2019	32	1240	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
10	B/O P..	625890	28	25-11-2018	03-06-2019	31.5	1630	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
11	B/O R..	628806	30	29-11-2018	25-01-2019	32.2	2030	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
12	B/O G..	628770	31	29-11-2018	19-02-2019	33.5	1955	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
13	B/O A..	625097	28	23-11-2018	18-12-2018	35	1525	F	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
14	GS ..	634603	26	03-11-2018	08-12-2018	34.4	2500	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
15	B/O B..	617088	27	10-11-2018	20-11-2018	32.2	1900	M	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	NO	NO	NO	NO
16	B/O K..	629991	29	01-12-2018	27-12-2019	32.5	1410	M	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
17	B/O K..	629995	29	01-12-2018	27-12-2019	32.5	1540	M	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
18	B/O M.K.	630119	29	01-12-2018	23-08-2019	32.4	1300	F	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	NO	NO	NO	NO
19	B/O R.1.	631256	29	03-12-2018	12-04-2019	30.1	800	F	SGA	NATURAL	TWIN	YES	NO	NO	NO	YES	NO	NO	NO	NO
20	B/O R.2.	631258	29	03-12-2018	12-04-2019	30.1	750	F	SGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
21	B/O S..	632749	30	06-12-2018	29-01-2019	33.3	1695	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
22	B/O N.D.	643923	26	08-12-2018	29-01-2019	36	1500	M	SGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
23	B/O N.K.	634266	27	08-12-2018	05-02-2019	31.4	1220	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
24	REVIKA ..	635505	31	10-12-2018	10-09-2019	30.4	1085	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
25	B/O M..	635273	25	10-12-2018	21-01-2019	35	1400	F	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
26	B/O M.K.	635141	25	10-12-2018	17-12-2019	30.6	1340	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
27	B/O J..	635981	26	11-12-2018	22-01-2019	33.2	1460	F	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
28	B/O B..	636448	29	12-12-2018	16-07-2019	33.4	2520	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
29	B/O K.K.	638037	30	15-12-2018	10-01-2019	32.3	2000	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
30	AS	660816	36	15-12-2018	16-04-2019	31.4	1465	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
31	B/O A.K.	639219	28	17-12-2018	07-05-2019	32	1560	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
32	NN	652843	29	17-12-2018	14-03-2019	31.4	1780	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
33	B/O K..	649117	27	17-12-2018	19-01-2019	30.6	1570	M	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
34	TT	649820	26	07-01-2019	23-04-2019	33.4	1280	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
35	B/O S.R.	651664	31	10-01-2019	02-02-2019	31.2	1500	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
36	B/O N..	653033	24	13-01-2019	29-01-2019	35.4	1960	M	SGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
37	B/O K..	652967	27	13-01-2019	24-09-2019	34.2	1440	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
38	B/O M.K.	637389	31	14-12-2018	31-08-2019	35.2	1705	M	SGA	NATURAL	SINGLETON	YES	YES	YES	NO	NO	NO	NO	NO	NO
39	B/O C..	649712	34	07-01-2019	05-02-2019	34	2240	M	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
40	B/O D.K.	649618	27	28-12-2018	30-04-2019	30	1035	M	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	YES	NO
41	B/O D.K.	644624	27	28-12-2018	30-04-2019	30	1320	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	YES	NO
42	B/O A.K.	646644	31	01-01-2019	08-02-2019	33.2	2820	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
43	B/O R.K.	656821	27	20-01-2019	18-10-2019	32.2	2300	M	AGA	IVF	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
44	B/O C.K.	646093	34	31-12-2018	09-02-2019	29.3	1175	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
45	B/O C.2.	689857	34	31-12-2018	09-02-2019	29.3	1200	M	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
46	B/O R..	652915	28	12-01-2019	20-12-2019	34	2000	F	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
47	B/O G.K.	645139	29	29-12-2018	10-09-2019	29.3	1020	F	AGA	NATURAL	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
48	B/O G.K.	645138	29	29-12-2018	10-09-2019	29.3	980	F	AGA	NATURAL	TWIN	YES	NO	YES	NO	YES	YES	NO	NO	NO
49	B/O H..	657746	24	22-01-2019	24-05-2019	32.5	2120	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
50	DS..	683596	34	12-01-2019	06-03-2019	34	2040	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO

SR. NO	NAME	MRD NO	OXYGEN	FETAL DYSTRESS	BLOOD TRANSFUSION	PDA	PHOTOTHERAPY	PIH	GDM	RDF	MATERNAL ANAEMIA	RE DIAGNOSIS	LE DIAGNOSIS	MANAGEMENT	LATERALITY	TYPE OF ROP RE	TYPE OF ROP ROP LE
1	B/O A..	614026	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
2	B/O S..	614335	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
3	B/ V..	616489	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO ROP	Z2S1	OBSERVATION	UNILATERAL	NO ROP	TYPE 2
4	B/O B..	620366	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
5	EK ..	640234	YES	NO	NO	YES	YES	NO	NO	NO	NO	Z3S1	NO ROP	OBSERVATION	UNILATERAL	TYPE 2	NO ROP
6	B/O S..	620732	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
7	B/O S..	620732	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
8	B/O J..	622166	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
9	B/O R..	625173	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z3S1	Z3S2	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
10	B/O P..	625890	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
11	B/O R..	628806	YES	NO	YES	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
12	B/O G..	628770	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
13	B/O A..	625097	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
14	GS ..	634603	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
15	B/O B..	617088	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
16	B/O K..	629991	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
17	B/O K..	629995	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
18	B/O M.K.	630119	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
19	B/O R.1.	631256	YES	NO	NO	NO	NO	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
20	B/O R.2.	631258	YES	NO	NO	NO	NO	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
21	B/O S..	632749	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
22	B/O N.D.	643923	NO	NO	NO	NO	NO	NO	NO	NO	NO	APROP	APROP	LASER	BILATERAL	TYPE 1	TYPE 1
23	B/O N.K.	634266	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
24	REVIKA ..	635505	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
25	B/O M..	635273	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
26	B/O M.K.	635141	YES	NO	NO	YES	YES	YES	NO	NO	NO	Z2S1	Z2S2	OBSERVATION	BILATERAL	TYPE 2	TYPE 1
27	B/O J..	635981	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
28	B/O B..	636448	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
29	B/O K.K.	638037	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
30	AS	660816	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
31	B/O A.K.	639219	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
32	NN	652843	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
33	B/O K..	649117	NO	NO	NO	NO	NO	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
34	TT	649820	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
35	B/O S.R.	651664	YES	YES	NO	NO	YES	NO	NO	NO	YES	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
36	B/O N..	653033	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
37	B/O K..	652967	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
38	B/O M.K.	637389	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
39	B/O C..	649712	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
40	B/O D.K.	649618	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
41	B/O D.K.	644624	YES	NO	NO	NO	NO	YES	NO	YES	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
42	B/O A.K.	646644	YES	NO	NO	NO	YES	NO	NO	NO	YES	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
43	B/O R.K.	656821	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
44	B/O C.K.	646093	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
45	B/O C.2.	689857	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
46	B/O R..	652915	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
47	B/O G.K.	645139	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S1	OBSERVATION	BILATERAL	TYPE 1	TYPE 2
48	B/O G.K.	645138	YES	NO	NO	YES	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
49	B/O H..	657746	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
50	DS..	683596	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP

SR. NO	NAME	MRD NO	MOTHER'S AGE	DOB	DOE	GA	BIRTH WEIGHT	SEX	BIRTH WEIGHT FOR GESTATIONAL AGE	CONCEPTION	RISK FACTOR	RDS	NNH	ANAEMIA	DIABETES	SURFACTANT	SEPSIS	SEIZURE	HTN	IVH
51	B/O S.K.	670472	32	13-02-2019	06-03-2019	33	1500	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
52	KG..	685406	32	19-01-2019	14-09-2019	29.2	1080	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
53	SS..	688477	30	15-02-2019	03-12-2019	32.3	1700	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
54	B/O A.M.	648283	48	04-01-2019	15-10-2019	26.4	920	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
55	B/O A.M.	648278	48	04-01-2019	15-10-2019	26.4	1000	M	AGA	IVF	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
56	B/O R.K.	656792	32	20-01-2019	16-08-2019	28.5	1000	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
57	B/O B..	648614	30	05-01-2019	15-03-2019	30.4	1140	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
58	B/O A.K.	644479	28	27-12-2019	15-03-2019	31.4	1730	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	YES	NO
59	B/O A.K.	644480	28	27-12-2019	15-03-2019	31.4	1680	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
60	AS	660816	41	15-12-2019	15-03-2019	31.6	1465	M	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
61	B/O P..	663775	28	01-02-2019	13-03-2019	31.5	1420	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	YES	NO
62	B/O S.S.	656390	32	19-01-2019	13-03-2019	29.2	1080	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
63	B/O J.K.	689857	35	22-02-2019	16-03-2019	30.5	1520	F	AGA	IVF	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
64	B/O M.K.	675746	26	21-02-2019	05-04-2019	33.1	1060	F	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
65	B/O P..	671482	26	14-02-2019	01-10-2019	32	2200	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
66	B/O H..	706032	29	01-03-2019	18-06-2019	32	1850	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
67	B/0 R..	681534	24	02-03-2019	03-03-2020	31.61	1430	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
68	B/O C.K.	675778	20	18-02-2019	18-06-2019	31.5	1500	M	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
69	B/O K.S.	664398	31	03-02-2019	26-03-2019	31.2	1240	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
70	B/O R.K.	658620	29	23-01-2019	26-03-2019	30.3	1050	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
71	SS	687808	24	01-02-2019	14-02-2020	34	1900	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
72	B/O D..	679650	29	28-02-2019	09-07-2019	30.2	1720	M	AGA	IVF	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
73	BB	988915	38	04-03-2019	01-04-2019	30.3	1420	F	AGA	IVF	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
74	HH..	699685	23	18-03-2019	04-09-2019	23	1800	M	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
75	B/O A.R.	688879	32	15-03-2019	30-04-2019	32.1	1550	F	AGA	IVF	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
76	B/O A.R.	688880	32	15-03-2019	30-04-2019	32.1	1185	F	SGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
77	B/O M.K.	678643	28	26-02-2019	07-05-2019	32.4	1260	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
78	B/O T.D.	686353	30	11-03-2019	05-04-2019	31.3	1485	M	AGA	IVF	TRIPLET	YES	YES	NO	NO	NO	YES	NO	NO	NO
79	B/O T.D.	686365	30	11-03-2019	05-04-2019	31.3	1470	F	AGA	IVF	TRIPLET	YES	YES	NO	NO	NO	NO	NO	NO	NO
80	GG	704055	24	23-03-2019	21-05-2019	32.1	1380	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
81	AS..	704866	29	27-02-2019	12-04-2019	34	1600	M	SGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
82	BS..	704868	29	27-02-2019	12-04-2019	34	2000	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
83	HS..	711063	29	03-04-2019	20-06-2019	33.6	1320	M	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
84	DK..	703639	30	07-03-2019	29-10-2019	30.6	1015	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
85	B/O M	687504	24	04-03-2019	15-04-2019	30	1100	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
86	UU	709362	30	15-03-2019	15-04-2019	34.4	2000	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
87	B/O R.K.	696554	29	26-03-2019	14-04-2019	36.4	1460	F	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
88	B/O T..	688237	34	13-03-2019	13-04-2019	34	1500	F	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
89	B/O M.B.	709853	25	06-04-2019	11-05-2019	35	1800	M	SGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
90	B/O P..	696434	34	26-03-2019	05-07-2019	32.5	1340	M	SGA	IVF	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
91	B/O G.K.	704139	26	06-04-2019	03-05-2019	34	1920	F	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
92	B/O S.	676696	32	20-11-2018	03-03-2020	27	820	M	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
93	B/O J..	635981	28	11-12-2019	23-04-2019	33	1460	F	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
94	B/O M.	687504	36	12-03-2019	29-04-2019	29	1180	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	YES	NO	NO	NO	NO
95	B/O M.	687507	36	12-03-2019	29-04-2019	29	1180	F	AGA	NATURAL	TWIN	NO	NO	YES	NO	YES	YES	NO	NO	NO
96	B/O N.J.	703158	26	21-04-2019	30-04-2019	34	1400	F	SGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	NO	NO	NO	NO
97	B/O S.K.	704355	30	08-04-2019	30-04-2019	32	1420	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
98	SK..	727399	23	02-03-2019	09-07-2019	32	2200	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
99	B/O K.K.	715363	29	24-04-2019	05-07-2019	34	1290	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
100	B/O J.K.	705050	24	08-04-2019	03-05-2019	34	2100	F	AGA	IVF	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO

SR. NO	NAME	MRD NO	OXYGEN	FETAL DYSTRESS	BLOOD TRANSFUSION	PDA	PHOTOTHERAPY	PIH	GDM	RDF	MATERNAL ANAEMIA	RE DIAGNOSIS	LE DIAGNOSIS	MANAGEMENT	LATERALITY	TYPE OF ROP RE	TYPE OF ROP ROP LE
51	B/O S.K.	670472	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
52	KG..	685406	YES	NO	NO	YES	NO	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
53	SS..	688477	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
54	B/O A.M.	648283	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
55	B/O A.M.	648278	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
56	B/O R.K.	656792	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
57	B/O B..	648614	NO	YES	NO	NO	NO	YES	NO	YES	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
58	B/O A.K.	644479	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
59	B/O A.K.	644480	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
60	AS	660816	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
61	B/O P..	663775	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
62	B/O S.S.	656390	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
63	B/O J.K.	689857	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
64	B/O M.K.	675746	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
65	B/O P..	671482	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
66	B/O H..	706032	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
67	B/0 R..	681534	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S1	Z2S2	OBSERVATION	BILATERAL	TYPE 2	TYPE 1
68	B/O C.K.	675778	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
69	B/O K.S.	664398	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
70	B/O R.K.	658620	YES	NO	NO	NO	NO	YES	NO	YES	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
71	SS	687808	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z3S2	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
72	B/O D..	679650	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
73	BB	988915	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
74	HH..	699685	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
75	B/O A.R.	688879	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
76	B/O A.R.	688880	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
77	B/O M.K.	678643	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
78	B/O T.D.	686353	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
79	B/O T.D.	686365	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
80	GG	704055	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
81	AS..	704866	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
82	BS..	704868	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
83	HS..	711063	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
84	DK..	703639	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
85	B/O M	687504	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
86	UU	709362	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
87	B/O R.K.	696554	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
88	B/O T..	688237	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
89	B/O M.B.	709853	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
90	B/O P..	696434	YES	YES	NO	NO	NO	YES	NO	YES	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
91	B/O G.K.	704139	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
92	B/O S.	676696	YES	NO	NO	NO	NO	YES	NO	NO	NO	Z2S2	Z2S2PP	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
93	B/O J..	635981	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
94	B/O M.	687504	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
95	B/O M.	687507	YES	YES	NO	NO	NO	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
96	B/O N.J.	703158	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
97	B/O S.K.	704355	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z3S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
98	SK..	727399	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
99	B/O K.K.	715363	YES	NO	NO	NO	YES	NO	NO	YES	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
100	B/O J.K.	705050	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP

SR. NO	NAME	MRD NO	MOTHER'S AGE	DOB	DOE	GA	BIRTH WEIGHT	SEX	BIRTH WEIGHT FOR GESTATIONAL AGE	CONCEPTION	RISK FACTOR	RDS	NNH	ANAEMIA	DIABETES	SURFACTANT	SEPSIS	SEIZURE	HTN	IVH
101	B/O R.L.	716456	31	26-04-2019	07-05-2019	36.2	1440	F	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
102	SC.	718536	29	12-04-2019	05-05-2019	34.2	1000	M	SGA	NATURAL	TRIPLET	YES	YES	NO	NO	NO	NO	NO	NO	NO
103	B/O S.G.	713179	25	21-04-2019	03-05-2019	37.3	1980	F	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
104	B/O V.K.	692158	27	19-03-2019	07-05-2019	31.6	1780	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
105	B/O N..	721823	28	10-04-2019	04-06-2019	29.6	1900	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
106	B/O B.D.	720877	25	03-05-2019	15/5/149	34.6	2100	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
107	B/O G.K.	716129	30	25-04-2019	15-11-2019	30.2	1640	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
108	HS..	721418	29	03-05-2019	30-07-2019	34.1	1900	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
109	B/O K.R.	725291	24	09-05-2019	06-07-2019	34	1800	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
110	B/O D.K.	728575	28	14-05-2019	23-05-2019	34	1785	M	SGA	IVF	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
111	B/O M..	731387	36	18-05-2019	29-05-2019	32	1420	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
112	Y ..	743802	23	17-05-2019	28-06-2019	31.3	1770	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
113	B/O D.K.	737694	32	28-05-2019	20-12-2019	32.5	2060	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
114	B/O B..	618662	30	13-11-2018	08-06-2019	30	1375	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
115	B/O K.S.	664398	28	03-02-2019	28-05-2019	31.2	1240	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
116	B/O V.G.	720557	24	02-05-2019	28-05-2009	32.3	1660	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
117	B/O V.G.	720569	24	02-05-2019	28-05-2019	32.3	1400	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
118	B/O P..	713153	35	18-04-2019	10-06-2019	33	1700	M	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
119	YONIT T..	735306	30	24-04-2019	30-11-2019	29	1480	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
120	B/O A.K.	717984	24	29-04-2019	08-07-2019	31	1620	F	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
121	B/O M.K.	604662	29	19-11-2018	17-12-2019	29.2	1600	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	YES	YES	NO	NO	NO
122	B/O M.K.	604663	29	19-11-2018	06-08-2019	29.2	1400	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	YES	NO
123	B/O N..	722111	27	30-04-2019	03-05-2019	35	1500	F	AGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
124	B/O R.K.	731525	27	19-05-2019	06-06-2019	31.4	1700	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
125	B/O D.K.	737694	27	28-05-2019	06-06-2019	32.5	2060	M	AGA	NATURAL	SINGLETON	YES	NO	YES	NO	NO	YES	NO	NO	NO
126	B/O G.R.	716862	25	26-04-2019	09-07-2019	27.5	880	M	SGA	IVF	TWIN	YES	YES	YES	NO	YES	NO	NO	NO	NO
127	HS..	750685	30	Apr-19	29-10-2019	26.2	960	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
128	B/O D.K.	743843	27	07-06-2019	13-07-2019	33.6	1840	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
129	B/O A.K.	721463	22	03-05-2019	18-06-2019	28	1000	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
130	B/O S.C.	733047	26	21-05-2019	05-07-2019	32.4	1700	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
131	B/O M..	747183	25	12-06-2019	22-06-2019	32.2	2100	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
132	B/O D.K.	741490	27	03-06-2019	30-09-2019	31.6	1200	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
133	B/O N.G.	747598	30	13-06-2019	29-06-2019	32	2060	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
134	B/O N.Z.	734064	38	23-05-2019	02-11-2019	28.1	1040	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
135	B/O D.K.	743848	27	07-06-2019	25-06-2019	33.6	1330	M	SGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
136	B/O S.K.	750685	34	18-04-2019	01-07-2019	26.2	960	M	AGA	IVF	SINGLETON	YES	YES	YES	NO	YES	YES	NO	NO	NO
137	B/O A.K.	742812	29	05-06-2019	08-10-2019	31.3	1610	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
138	B/O A.K.	742813	29	05-06-2019	08-10-2019	31.3	1740	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
139	B/O G.K.	747918	29	13-06-2019	26-11-2019	32.5	1920	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
140	B/O A.K.	706583	22	10-04-2019	09-07-2019	33	1560	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
141	B/O A.K.	747885	29	13-06-2019	00-01-1900	33	2120	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
142	B/O G.K.	747920	29	13-06-2019	26-11-2019	32.5	1660	M	SGA	NATURAL	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
143	B/O P.1.	739751	24	31-05-2019	06-07-2019	34	1600	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
144	B/O P.2.	739753	24	31-05-2019	06-07-2019	34	1580	F	SGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
145	B/O J..	749277	25	06-06-2019	05-07-2019	34	2250	F	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
146	B/O A.K.	717384	29	29-04-2019	08-07-2019	31	1845	F	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
147	B/O A.K.	717984	29	29-04-2019	16-09-2019	31	1620	F	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
148	GUR M.S.	716206	38	26-04-2019	16-07-2019	26	820	M	AGA	NATURAL	SINGLETON	YES	YES	YES	NO	YES	YES	NO	NO	NO
149	B/O H.K.	737353	29	28-05-2019	17-07-2019	30	825	F	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
150	B/O K.R.	760374	29	03-07-2019	26-09-2019	30	1500	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO

SR. NO	NAME	MRD NO	OXYGEN	FETAL DYSTRESS	BLOOD TRANSFUSION	PDA	PHOTOTHERAPY	PIH	GDM	RDF	MATERNAL ANAEMIA	RE DIAGNOSIS	LE DIAGNOSIS	MANAGEMENT	LATERALITY	TYPE OF ROP RE	TYPE OF ROP ROP LE
101	B/O R.L.	716456	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
102	SC.	718536	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
103	B/O S.G.	713179	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
104	B/O V.K.	692158	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
105	B/O N..	721823	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
106	B/O B.D.	720877	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
107	B/O G.K.	716129	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z3S3PP	Z3S3PP	LASER	BILATERAL	TYPE 1	TYPE 1
108	HS..	721418	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
109	B/O K.R.	725291	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	NO ROP	OBSERVATION	UNILATERAL	TYPE 2	NO ROP
110	B/O D.K.	728575	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
111	B/O M..	731387	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
112	Y ..	743802	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
113	B/O D.K.	737694	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
114	B/O B..	618662	YES	NO	NO	NO	YES	NO	YES	NO	NO	Z1S2PP	Z1S2	LASER	BILATERAL	TYPE 1	TYPE 2
115	B/O K.S.	664398	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
116	B/O V.G.	720557	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
117	B/O V.G.	720569	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
118	B/O P..	713153	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
119	YONIT T..	735306	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2PP	Z2S2PP	LASER	BILATERAL	TYPE 1	TYPE 1
120	B/O A.K.	717984	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
121	B/O M.K.	604662	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
122	B/O M.K.	604663	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
123	B/O N..	722111	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
124	B/O R.K.	731525	YES	YES	NO	NO	YES	NO	NO	NO	YES	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
125	B/O D.K.	737694	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
126	B/O G.R.	716862	YES	YES	NO	NO	YES	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
127	HS..	750685	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
128	B/O D.K.	743843	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
129	B/O A.K.	721463	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
130	B/O S.C.	733047	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
131	B/O M..	747183	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
132	B/O D.K.	741490	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
133	B/O N.G.	747598	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
134	B/O N.Z.	734064	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
135	B/O D.K.	743848	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
136	B/O S.K.	750685	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
137	B/O A.K.	742812	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
138	B/O A.K.	742813	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
139	B/O G.K.	747918	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
140	B/O A.K.	706583	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
141	B/O A.K.	747885	YES	YES	NO	NO	YES	NO	NO	NO	YES	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
142	B/O G.K.	747920	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
143	B/O P.1.	739751	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
144	B/O P.2.	739753	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
145	B/O J..	749277	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
146	B/O A.K.	717384	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
147	B/O A.K.	717984	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
148	GUR M.S.	716206	YES	NO	YES	NO	YES	YES	NO	YES	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
149	B/O H.K.	737353	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
150	B/O K.R.	760374	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP

SR. NO	NAME	MRD NO	MOTHER'S AGE	DOB	DOE	GA	BIRTH WEIGHT	SEX	BIRTH WEIGHT FOR GESTATIONAL AGE	CONCEPTION	RISK FACTOR	RDS	NNH	ANAEMIA	DIABETES	SURFACTANT	SEPSIS	SEIZURE	HTN	IVH
151	B/O K..	765621	29	11-07-2019	06-08-2019	33	1700	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
152	B/O M..	766512	27	13-07-2019	21-09-2019	31	1500	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
153	B/O M.K.	763101	29	08-07-2019	27-08-2019	33	1320	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
154	B/O V.K.	760511	32	04-07-2019	10-12-2019	31	1400	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
155	B/O V.K.	760524	32	04-07-2019	10-12-2019	31	1340	M	AGA	IVF	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
156	b/o A.K.	765252	28	11-07-2019	30-07-2019	33	2190	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
157	B/O M.K.	749200	29	16-06-2019	30-07-2019	31	2000	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
158	B/O R.K.	769423	24	17-07-2019	17-08-2019	31	1360	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
159	B/O R..	767324	28	15-07-2019	18-12-2019	32.3	1580	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
160	AS..	783464	30	09-06-2019	07-08-2019	32	1300	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
161	B/O R.K.	761143	31	04-07-2019	10-08-2019	30.5	1030	M	AGA	NATURAL	SINGLETON	NO	YES	NO	NO	NO	NO	NO	NO	NO
162	B/O R.T.	768803	28	17-07-2019	18-08-2019	31.5	1600	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
163	GUR M.S.	768347	40	24-06-2019	24-08-2019	26	820	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
164	B/O J.K.	771726	28	20-07-2019	07-03-2020	29.3	1480	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
165	B/O G.	768193	42	16-07-2019	16-09-2019	29.3	1375	M	AGA	IVF	TRIPLET	YES	YES	NO	NO	NO	YES	NO	NO	NO
166	B/O G.	768203	42	16-07-2019	16-09-2019	29.3	1420	M	AGA	IVF	TRIPLET	YES	YES	NO	NO	NO	YES	NO	NO	NO
167	B/O G.	768205	42	16-07-2019	16-09-2019	29.3	1260	M	AGA	IVF	TRIPLET	YES	YES	NO	NO	YES	YES	NO	NO	NO
168	B/O S..	784507	34	08-08-2019	22-08-2019	32.6	1825	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
169	B/O N.K.	781118	32	03-08-2019	21-09-2019	32.5	2400	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
170	B/O R.	769424	24	17-07-2019	17-08-2019	31.5	870	F	SGA	IVF	TWIN	YES	NO	NO	NO	YES	YES	NO	NO	NO
171	B/O M.K.	779558	27	01-08-2019	15-10-2019	31.2	1560	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
172	B/O A.K.	771004	37	19-07-2019	13-11-2019	30	1200	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
173	B/O A..	775845	30	26-07-2019	22-11-2019	28.6	1180	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
174	B/O S..	782251	26	05-08-2019	14-11-2019	31.3	1200	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
175	B/O K..	793256	21	22-08-2019	18-09-2019	32.1	1100	F	SGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
176	B/O K.K.	792756	40	21-08-2019	05-09-2019	31.6	1240	M	AGA	IVF	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
177	B/O R..	791750	34	20-08-2019	26-11-2019	31	1885	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
178	AJ.	800086	26	23-08-2019	29-11-2019	33.2	1480	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
179	B/O G.	790438	26	19-08-2019	03-09-2019	33	2300	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
180	B/O S.K.	768591	32	16-07-2019	30-11-2019	33.1	1000	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
181	B/O P.K.	507538	30	28-05-2019	09-09-2019	27	740	M	SGA	NATURAL	SINGLETON	YES	NO	YES	NO	YES	YES	NO	NO	NO
182	B/O H..	784984	29	09-08-2019	05-09-2019	32.2	1520	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
183	B/O A..	786728	27	12-08-2019	01-10-2019	30.4	1460	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
184	NS..	810088	23	05-09-2019	14-09-2019	32	1960	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
185	JK..	810092	23	05-09-2019	14-09-2019	32	1700	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
186	B/O A.K.	794320	32	24-08-2019	25-12-2019	28.4	1400	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
187	B/O P.K.	804191	25	06-09-2019	06-01-2020	31.6	1920	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
188	B/O S.S.	808886	33	12-09-2019	02-11-2019	31.3	1360	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
189	B/O G.K.	784370	37	08-08-2019	22-11-2019	27	1100	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
190	B/O S.K.	676124	32	22-02-2019	26-09-2019	28	1220	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
191	JAPJI K..	810279	46	21-08-2019	22-10-2019	31.6	1420	F	AGA	IVF	TWIN	YES	NO	NO	NO	YES	YES	NO	NO	NO
192	JS..	810280	46	21-08-2019	22-10-2019	31.6	1240	M	AGA	IVF	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
193	B/O R.K.	808761	31	12-09-2019	29-10-2019	33.2	1880	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
194	B/O M.K.	797744	26	28-08-2019	24-09-2019	33.5	1660	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
195	b/o m.k.	689851	29	16-03-2019	14-09-2019	33.6	2220	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
196	ASHISH ..	821459	28	13-08-2019	01-10-2019	31	1000	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
197	B/O J.K.	812267	33	17-09-2019	23-11-2019	33	1500	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
198	B/O G..	792250	35	21-08-2019	03-03-2020	29.6	940	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
199	B/O R.	830418	28	25-08-2019	14-11-2019	28	1549	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
200	B/O R.	830419	28	25-08-2019	14-11-2019	28	1549	M	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO

SR. NO	NAME	MRD NO	OXYGEN	FETAL DYSTRESS	BLOOD TRANSFUSION	PDA	PHOTOTHERAPY	PIH	GDM	RDF	MATERNAL ANAEMIA	RE DIAGNOSIS	LE DIAGNOSIS	MANAGEMENT	LATERALITY	TYPE OF ROP RE	TYPE OF ROP ROP LE
151	B/O K..	765621	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
152	B/O M..	766512	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
153	B/O M.K.	763101	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
154	B/O V.K.	760511	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
155	B/O V.K.	760524	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
156	b/o A.K.	765252	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
157	B/O M.K.	749200	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
158	B/O R.K.	769423	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
159	B/O R..	767324	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
160	AS..	783464	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S2	NO ROP	OBSERVATION	UNILATERAL	TYPE 1	NO ROP
161	B/O R.K.	761143	YES	NO	NO	YES	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
162	B/O R.T.	768803	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
163	GUR M.S.	768347	YES	NO	NO	NO	NO	YES	NO	NO	NO	Z2S3	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
164	B/O J.K.	771726	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S2	OBSERVATION	BILATERAL	TYPE 2	TYPE 1
165	B/O G.	768193	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
166	B/O G.	768203	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
167	B/O G.	768205	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
168	B/O S..	784507	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
169	B/O N.K.	781118	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
170	B/O R.	769424	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
171	B/O M.K.	779558	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
172	B/O A.K.	771004	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
173	B/O A..	775845	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
174	B/O S..	782251	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
175	B/O K..	793256	YES	NO	NO	NO	NO	YES	NO	NO	YES	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
176	B/O K.K.	792756	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
177	B/O R..	791750	YES	YES	NO	NO	YES	NO	NO	NO	NO	Z3S2	Z3S2	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
178	AJ.	800086	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
179	B/O G.	790438	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
180	B/O S.K.	768591	YES	NO	NO	YES	YES	YES	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
181	B/O P.K.	507538	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
182	B/O H..	784984	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
183	B/O A..	786728	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
184	NS..	810088	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z3S1	NO ROP	OBSERVATION	UNILATERAL	TYPE 2	NO ROP
185	JK..	810092	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
186	B/O A.K.	794320	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
187	B/O P.K.	804191	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
188	B/O S.S.	808886	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
189	B/O G.K.	784370	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
190	B/O S.K.	676124	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S3PP	Z3S2	LASER	BILATERAL	TYPE 1	TYPE 1
191	JAPJI K..	810279	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
192	JS..	810280	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
193	B/O R.K.	808761	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
194	B/O M.K.	797744	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
195	b/o m.k.	689851	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO ROP	Z3S1	OBSERVATION	UNILATERAL	NO ROP	TYPE 2
196	ASHISH ..	821459	YES	YES	NO	NO	YES	YES	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
197	B/O J.K.	812267	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
198	B/O G..	792250	YES	YES	NO	NO	YES	YES	NO	YES	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
199	B/O R.	830418	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
200	B/O R.	830419	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1

SR. NO	NAME	MRD NO	MOTHER'S AGE	DOB	DOE	GA	BIRTH WEIGHT	SEX	BIRTH WEIGHT FOR GESTATIONAL AGE	CONCEPTION	RISK FACTOR	RDS	NNH	ANAEMIA	DIABETES	SURFACTANT	SEPSIS	SEIZURE	HTN	IVH
201	B/O M..	818592	34	26-09-2019	18-10-2019	32.6	2415	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
202	B/O S..	813729	32	19-09-2019	18-10-2019	32.5	2125	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
203	B/O L.K.	789848	25	17-08-2019	08-10-2019	31.2	1130	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
204	A ..	703843	26	06-02-2019	10-10-2019	29.1	860	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
205	B/O R..	761830	38	05-07-2019	15-10-2019	25.2	700	F	AGA	NATURAL	SINGLETON	YES	NO	YES	NO	YES	YES	NO	NO	NO
206	B/O P..	813320	26	19-09-2019	11-12-2019	34	1260	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
207	B/O P.K.	800426	36	01-09-2019	20-12-2019	30.1	1460	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
208	B/O P.K.	813465	35	19-09-2019	12-11-2019	33	1835	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
209	B/O A.K.	717980	29	29-04-2019	04-11-2019	31.4	1845	F	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
210	B/O A.K.	717984	29	29-04-2019	04-11-2019	31.4	1620	F	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
211	B/O P.K.	806508	37	09-09-2019	02-11-2019	29.1	1340	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	YES	YES	NO	NO	NO
212	DHAMI ..	841631	25	08-03-2019	02-11-2019	32	1400	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
213	B/O S..	838803	21	11-10-2019	06-12-2019	30	1400	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
214	B/O K.K.	823674	23	04-10-2019	28-12-2019	31	1480	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
215	B/O G.K.	825582	24	08-10-2019	30-10-2019	31	1460	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
216	B/O R.K.	822069	35	02-10-2019	05-11-2019	30.6	1185	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
217	B/O H.K.	802276	30	04-09-2019	04-12-2019	25.4	900	M	AGA	NATURAL	SINGLETON	YES	YES	YES	NO	NO	NO	NO	NO	NO
218	B/O H.K.	835536	30	23-10-2019	14-11-2019	32.4	1640	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
219	B/O R.K.	838130	26	29-10-2019	06-01-2020	33	1500	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
220	GK	827270	30	07-08-2019	17-12-2019	27.5	980	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
221	B/O AKK	813685	29	19-09-2019	18-12-2019	29.2	1260	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
222	B/O VG	816196	30	23-09-2019	08-11-2019	33.4	1800	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
223	B/O SK	846506	33	9/11/419	19/11/19*	33	2700	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
224	B/O JK	812144	30	17-09-2019	11-02-2020	27.2	920	M	AGA	NATURAL	TWIN	YES	YES	YES	NO	YES	NO	NO	NO	NO
225	B/O BR	836731	30	19-10-2019	23-11-2019	34	1500	M	SGA	IVF	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
226	B/O CV	849397	20	14-11-2019	23-11-2019	32	2180	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
227	AK	854562	30	19-11-2019	19-12-2019	30	1100	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
228	B/O DP	8582069	31	29-10-2019	29-11-2019	29	1140	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
229	B/O HK	844824	29	07-11-2019	13-03-2020	32.5	1400	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
230	B	854684	24	08-11-2019	26-12-2019	32.4	1390	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
231	B/O GK	849588	28	15-11-2019	06-12-2019	31	1740	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
232	B/O K	794851	36	24-08-2019	27-12-2019	30.2	1340	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
233	B/O I	829427	31	14-10-2019	31-12-2019	29	1040	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	YES	YES	NO	NO	NO
234	B/O I	829442	31	14-10-2019	04-02-2020	29	1135	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	YES	YES	NO	NO	NO
235	B/O SK	828974	35	13-10-2019	27-12-2019	29.4	1300	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
236	B/O K	855311	22	24-11-2019	10-12-2019	32.6	1940	F	AGA	NATURAL	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
237	B/O K	855309	22	24-11-2019	10-12-2019	32.6	1740	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
238	B/O KK	843990	27	06-11-2019	10-01-2020	30.4	1420	M	AGA	NATURAL	SINGLETON	YES	YES	YES	NO	YES	NO	NO	NO	NO
239	B/O K	859120	24	30-11-2019	26-12-2019	31.1	1900	F	AGA	NATURAL	SINGLETON	YES	YES	YES	NO	NO	YES	NO	NO	NO
240	B/O K	855304	25	24-11-2019	28-12-2019	31.5	1440	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
241	B/O JK	812142	30	17-09-2019	11-03-2020	27	880	M	AGA	NATURAL	TWIN	YES	NO	YES	NO	YES	YES	NO	NO	NO
242	B/O GK	849588	28	15-11-2019	20-12-2019	31	1740	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
243	NK	828679	35	04-10-2019	20-12-2019	31	1600	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
244	B/O NK	852457	30	19-11-2019	07-02-2020	32.1	1460	M	AGA	NATURAL	SINGLETON	YES	YES	YES	NO	NO	YES	NO	NO	NO
245	B/O M	855328	24	24-11-2019	28-12-2019	32	1250	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
246	B/O R	853818	24	21-11-2019	29-05-2020	30.3	1460	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
247	B/O A	829362	35	14-10-2019	17-12-2019	28.1	900	M	AGA	IVF	TWIN	YES	YES	YES	NO	YES	YES	NO	NO	NO
248	S	871664	28	12-12-2019	24-12-2019	33.3	1965	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
249	B/O GR	867658	27	16-12-2019	01-01-2020	31	1460	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
250	B/O R	867184	29	15-12-2019	17-02-2020	32.5	1420	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO

SR. NO	NAME	MRD NO	OXYGEN	FETAL DYSTRESS	BLOOD TRANSFUSION	PDA	PHOTOTHERAPY	PIH	GDM	RDF	MATERNAL ANAEMIA	RE DIAGNOSIS	LE DIAGNOSIS	MANAGEMENT	LATERALITY	TYPE OF ROP RE	TYPE OF ROP ROP LE
201	B/O M..	818592	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
202	B/O S..	813729	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
203	B/O L.K.	789848	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
204	A ..	703843	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
205	B/O R..	761830	YES	NO	NO	NO	NO	YES	NO	NO	NO	Z1S2	Z1S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
206	B/O P..	813320	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
207	B/O P.K.	800426	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S3PP	Z3S3PP	LASER	BILATERAL	TYPE 1	TYPE 1
208	B/O P.K.	813465	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
209	B/O A.K.	717980	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
210	B/O A.K.	717984	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
211	B/O P.K.	806508	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
212	DHAMI ..	841631	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
213	B/O S..	838803	YES	NO	YES	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
214	B/O K.K.	823674	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
215	B/O G.K.	825582	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
216	B/O R.K.	822069	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
217	B/O H.K.	802276	YES	NO	YES	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
218	B/O H.K.	835536	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
219	B/O R.K.	838130	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
220	GK	827270	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2PP	Z2S2PP	LASER	BILATERAL	TYPE 1	TYPE 1
221	B/O AKK	813685	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
222	B/O VG	816196	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
223	B/O SK	846506	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
224	B/O JK	812144	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
225	B/O BR	836731	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
226	B/O CV	849397	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
227	AK	854562	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
228	B/O DP	8582069	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
229	B/O HK	844824	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
230	B	854684	YES	NO	NO	NO	YES	NO	NO	YES	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
231	B/O GK	849588	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
232	B/O K	794851	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z3S1	Z3S1	LASER	BILATERAL	TYPE 2	TYPE 2
233	B/O I	829427	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
234	B/O I	829442	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
235	B/O SK	828974	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
236	B/O K	855311	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
237	B/O K	855309	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
238	B/O KK	843990	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
239	B/O K	859120	YES	NO	YES	NO	YES	NO	NO	NO	YES	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
240	B/O K	855304	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
241	B/O JK	812142	YES	NO	NO	NO	NO	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
242	B/O GK	849588	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
243	NK	828679	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
244	B/O NK	852457	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S2	OBSERVATION	BILATERAL	TYPE 2	TYPE 1
245	B/O M	855328	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
246	B/O R	853818	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
247	B/O A	829362	YES	YES	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
248	S	871664	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
249	B/O GR	867658	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
250	B/O R	867184	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP

SR. NO	NAME	MRD NO	MOTHER'S AGE	DOB	DOE	GA	BIRTH WEIGHT	SEX	BIRTH WEIGHT FOR GESTATIONAL AGE	CONCEPTION	RISK FACTOR	RDS	NNH	ANAEMIA	DIABETES	SURFACTANT	SEPSIS	SEIZURE	HTN	IVH
251	B/O P	833342	32	21-10-2019	11-01-2020	27.6	860	F	AGA	NATURAL	SINGLETON	YES	YES	YES	NO	YES	YES	NO	NO	NO
252	B/O MV	872676	33	26-12-2019	11-01-2020	34	1560	M	SGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
253	B/O MB	872679	33	26-12-2019	11-01-2020	34	1620	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
254	B/O IS	870330	29	21-12-2019	10-01-2020	33	2400	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
255	HK	901778	28	19-01-2020	04-03-2020	34	1900	F	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	YES	NO	NO	NO
256	B/O AK	878192	28	08-01-2020	09-03-2020	31.5	1200	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
257	B/O RK	879441	36	10-01-2020	08-06-2020	30	1275	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
258	B/O RK	879443	36	10-01-2020	08-06-2020	30	1300	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
259	B/O PK	880247	36	13-01-2020	19-02-2020	32	1180	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
260	B/O M	880050	28	11-01-2020	04-03-2020	32.6	1160	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
261	B/O B	891655	25	03-02-2020	15-02-2020	33.1	1660	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
262	B/O LK	888028	23	27-01-2020	15-02-2020	32.2	1895	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
263	GS	883459	22	03-12-2019	25-02-2020	28	980	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
264	B/O NK	892524	28	04-02-2020	10-03-2020	33.2	2170	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
265	B/O M	882093	39	27-01-2020	03-03-2020	33.4	1980	M	AGA	IVF	TWIN	YES	NO	NO	NO	NO	YES	NO	NO	NO
266	B/O M	882087	39	27-01-2020	03-03-2020	33.4	1960	M	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
267	B/O AR	881974	34	16-01-2020	10-02-2020	32	1640	F	AGA	IVF	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
268	B/O AR	881970	34	16-01-2020	10-02-2020	32	1710	F	AGA	IVF	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO
269	MS	895754	32	17-12-2019	10-02-2020	32	1400	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
270	B/O PK	868521	32	17-12-2019	07-02-2020	32	1760	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
271	B/O A	882649	30	24-12-2019	08-02-2020	34	1700	M	SGA	NATURAL	SINGLETON	NO	NO	NO	NO	NO	YES	NO	NO	NO
272	B/O MK	889269	24	30-11-2019	07-02-2020	34	1600	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
273	B/O GK	873609	30	28-12-2019	08-02-2020	31.6	1470	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	YES	NO	NO	NO
274	B/O GK	873605	30	28-12-2019	08-02-2020	31.6	1430	M	AGA	NATURAL	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
275	B/O PK	873175	39	27-12-2019	11-02-2020	31.4	1240	M	AGA	IVF	TRIPLET	YES	YES	NO	NO	NO	NO	NO	NO	NO
276	B/O PK	873176	39	27-12-2019	11-02-2020	31.4	1130	F	AGA	IVF	TRIPLET	YES	YES	NO	NO	NO	NO	NO	NO	NO
277	B/O PK	873177	39	27-12-2019	11-02-2020	31.4	1140	M	SGA	IVF	TRIPLET	YES	YES	NO	NO	NO	NO	NO	NO	NO
278	B/O MK	846402	28	08-11-2019	20-01-2020	26	880	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
279	B/O N	858781	34	29-11-2019	04-02-2020	31.2	940	M	SGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	NO	NO	NO	NO
280	H	878807	27	06-11-2019	04-02-2020	32	1900	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
281	B/O RK	854463	35	22-11-2019	23-01-2020	28	1205	M	AGA	IVF	TWIN	YES	NO	YES	NO	NO	YES	NO	NO	NO
282	B/O RK	854462	35	22-11-2019	23-01-2020	28	1180	F	AGA	IVF	TWIN	YES	NO	YES	NO	NO	YES	NO	NO	NO
283	SK	904033	29	11-02-2020	07-03-2020	33	1600	M	AGA	NATURAL	SINGLETON	YES	NO	NO	NO	NO	NO	NO	NO	NO
284	B/O PK	888623	35	28-01-2020	06-03-2020	33	1740	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
285	B/O FK	885298	38	22-01-2020	04-03-2020	29	1260	M	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	YES	YES	NO	NO	NO
286	B/O GK	884749	37	21-01-2020	10-03-2020	27.3	1095	F	AGA	IVF	SINGLETON	YES	YES	NO	NO	NO	YES	NO	NO	NO
287	B/O SK	907866	37	28-02-2020	16-03-2020	33	1590	F	AGA	NATURAL	SINGLETON	YES	YES	NO	NO	NO	NO	NO	NO	NO
288	B/O R	886222	44	24-01-2020	07-04-2020	28	1130	M	AGA	IVF	TWIN	YES	YES	NO	NO	YES	NO	NO	NO	NO
289	B/O M	917075	40	16-03-2020	10-04-2020	31.4	1980	F	AGA	IVF	TWIN	YES	YES	NO	NO	NO	NO	NO	NO	NO
290	B/O M	917084	40	16-03-2020	14-04-2020	31.4	1640	F	AGA	IVF	TWIN	YES	NO	NO	NO	NO	NO	NO	NO	NO

SR. NO	NAME	MRD NO	OXYGEN	FETAL DYSTRESS	BLOOD TRANSFUSION	PDA	PHOTOTHERAPY	PIH	GDM	RDF	MATERNAL ANAEMIA	RE DIAGNOSIS	LE DIAGNOSIS	MANAGEMENT	LATERALITY	TYPE OF ROP RE	TYPE OF ROP ROP LE
251	B/O P	833342	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
252	B/O MV	872676	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
253	B/O MB	872679	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
254	B/O IS	870330	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
255	HK	901778	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
256	B/O AK	878192	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
257	B/O RK	879441	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S2	Z2S2PP	LASER	BILATERAL	TYPE 1	TYPE 1
258	B/O RK	879443	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
259	B/O PK	880247	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
260	B/O M	880050	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
261	B/O B	891655	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
262	B/O LK	888028	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
263	GS	883459	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
264	B/O NK	892524	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
265	B/O M	882093	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
266	B/O M	882087	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
267	B/O AR	881974	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
268	B/O AR	881970	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
269	MS	895754	YES	NO	NO	NO	NO	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
270	B/O PK	868521	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
271	B/O A	882649	NO	NO	NO	NO	NO	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
272	B/O MK	889269	YES	NO	YES	NO	YES	YES	NO	NO	NO	Z2S3	Z2S3	AVASTIN	BILATERAL	TYPE 1	TYPE 1
273	B/O GK	873609	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
274	B/O GK	873605	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
275	B/O PK	873175	YES	YES	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
276	B/O PK	873176	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
277	B/O PK	873177	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
278	B/O MK	846402	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
279	B/O N	858781	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S3PP	Z2S3PP	LASER	BILATERAL	TYPE 1	TYPE 1
280	H	878807	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z3S1	Z3S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
281	B/O RK	854463	YES	NO	NO	YES	NO	NO	NO	NO	YES	Z2S2	Z2S1	OBSERVATION	BILATERAL	TYPE 1	TYPE 2
282	B/O RK	854462	YES	NO	NO	YES	NO	NO	NO	NO	YES	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
283	SK	904033	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
284	B/O PK	888623	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
285	B/O FK	885298	YES	NO	NO	NO	YES	NO	NO	NO	NO	Z2S2	Z2S2	OBSERVATION	BILATERAL	TYPE 1	TYPE 1
286	B/O GK	884749	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
287	B/O SK	907866	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP
288	B/O R	886222	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
289	B/O M	917075	YES	NO	NO	NO	YES	YES	NO	NO	NO	Z2S1	Z2S1	OBSERVATION	BILATERAL	TYPE 2	TYPE 2
290	B/O M	917084	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO ROP	NO ROP	OBSERVATION	NO ROP	NO ROP	NO ROP

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No. BFUHS/2K19p-TH/ 12202 **Date** 15/x/19

The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 29.05.2019 has approved the plan of thesis of **Madhushmita Mahapatra**, a student of your college for **MS Ophthalmology** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis

To study the incidence of retinopathy of prematurity in preterm neonates ≤ 34 weeks

Supervisor
Dr. Sumeet Chopra
Assoc. Prof.,
Dept. of Ophthalmology,
DMCH, Ludhiana.

Co-Supervisor
Dr. Priyanka Arora
Asst. Prof.,
Dept. of Ophthalmology,
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Dr. Kamaldeep Arora
Assoc. Prof.,
Dept. of Paediatrics,
DMCH, Ludhiana.

The student has to submit the four copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

109. If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.

110. The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.

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The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

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Topic Plan of Thesis

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Supervisor
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Dr. S P Singh MS(Oph)
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110. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF SURGERY

In

OPHTHALMOLOGY

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

NOVEMBER, 2018

DR. MADHUSHMITA MAHAPATRA

DEPARTMENT OF OPHTHALMOLOGY
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS
For the degree of	M.S. Ophthalmology
Name of the candidate	Dr. Madhushmita Mahapatra
Supervisor	Dr. Sumeet Chopra, Associate Professor & Head, Department of Ophthalmology, DMCH, Ludhiana
Co-supervisor(s)	Dr. Priyanka Arora, Assistant Professor, Department of Ophthalmology, DMCH, Ludhiana Dr. Kamaldeep Arora, Associate Professor, Department of Paediatrics, DMCH, Ludhiana
Institution	Dayanand Medical College and Hospital,Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Retinopathy of prematurity (ROP) is a neovascular eye disease that affects the developing retina in premature infants. There have been multiple studies done on ROP in western countries but there are only a few from northern india and especially from Punjab region. So we want to study the incidence and risk factors of ROP in our institute.

Aim of Study: 1. To determine the incidence of retinopathy of prematurity in preterm neonates and associated risk factors..

Materials & methods: All the preterm neonates born in or referred to Dayanand medical college and hospital, Ludhiana, Punjab will be prospectively screened for ROP in Neonatal Intensive Care Unit(NICU) and followed up in department of Ophthalmology OPD from November 2018 to March 2020.

Clinical Significance: ROP is a vasoproliferative retinal disorder which affects preterm newborns. It can lead to blindness in its natural course, or when treatment is not provided in time. The pathogenesis of ROP is multifactorial, although the most recognised risk factors are low birth weight and low gestational age. Hence we will study the incidence and risk factors of ROP in all the preterms ≤34weeks gestational age.

Keywords: Retinopathy of prematurity, Gestational age, AGA, SGA.

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled "**TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS**" exist in the Department of Ophthalmology at Dayanand Medical College and Hospital, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis are genuine and are collected by the candidate herself under our supervision and guidance.

Supervisor

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Associate Professor & Head
Department of Ophthalmology
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Co-Supervisor

Dr. Priyanka Arora
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DMCH, Ludhiana

Place : Ludhiana

Date : 21/12/18

APPROVAL PROFORMA
BY RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Madhushmita Mahapatra
Department	Ophthalmology
Topic of Thesis	TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS
Likely date of appearing in PG examination	MAY 2021
Date of enrollment	MAY 10, 2018
Name of Head of Department	Dr. Sumeet Chopra
1) Supervisor **2) Co-Supervisor**	Dr. Sumeet Chopra Dr. Priyanka Arora Dr. Kamaldeep Arora
Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
1. HOD Pharmacology	1. HOD Physiology
2. HOD Surgery	2. HOD Pathology
3. HOD Pathology	3. HOD Pharmacology
4. HOD Medicine	4. HOD SPM
5. Dean Academics	5. HOD Medicine
6. Vice Principal	6. HOD Surgery
	7. HOD Obst. & Gynae.
	8. Legal Expert
	9. Secretary, IEC
	10. Dean Academics
	11. Vice Principal
	12. Principal

Approved: Yes / No

Chairperson
Research Committee

Chairperson
Research Committee

Approved : Yes / ~~No~~

Chairperson
Ethics Committee

Chairperson
Ethics Committee

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	**NAME OF THE CANDIDATE AND ADDRESS**	DR. Madhushmita Mahapatra 14/23,Narang children's hospital Outside Nehru gate, batala, Punjab
2	**NAME OF THE INSTITUTE**	DAYANAND MEDICAL COLLEGE AND HOSPITAL, LUDHIANA
3	**COURSE OF STUDY AND SUBJECT**	M.S. OPHTHALMOLOGY
4	**DATE OF ADMISSION OF COURSE**	10th MAY, 2018
5	**TITLE OF THE TOPIC**	TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34WEEKS

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Retinopathy of prematurity (ROP), previously known as retrolental fibroplasia is a multifactorial vasoproliferative retinal disorder of premature infants.[1] An array of risk factors are proposed to be responsible for ROP.[1,2] The spectrum of ROP ranges from mild cases with out visual sequelae to advanced cases with bilateral irreversible blindness.[3]

The possible mechanism of injury suggested for pathogenesis of ROP is vasoconstriction, increase in level of vasogenic factors like vasculo endothelial growth factor (VEGF) and compensatory neovascularisation due to ischaemia, leading to severe extraretinal fibrovascular proliferation and retinal detachment.[1]

Retinal vascular development begins at 16th week of gestation through vasculogenesis, which is a process of de novo development of vasculature involving proliferation, differentiation and organization of blood vessels. Angiogenesis then proceeds to extend the retinal vasculature to periphery, completing it nasally by 36th week and temporally by 40th week of gestation.[3]

Many risk factors are proposed to be associated with ROP like low GA, low birth weight, prolonged oxygen exposure, severity of neonatal illnesses, severe respiratory distress requiring mechanical ventilation, shock, sepsis, hypoxia, prolonged ventilatory support, blood transfusion, intraventricular hemorrhage, acidosis, anemia, high ambient light, vitamin E deficiency etc [1,2]

Incidence of rop has been reported variously from 35 to 60% in various studies.[4-6] ROP is emerging as one of the leading cause of preventable childhood

blindness.[2] The percentage of pediatric blindness contributed by ROP range from 3-11% in highly developed countries and as high as 60% in developing countries.[7-9]

ROP is not detected before 32 weeks of gestational age (GA). The median age at detection of stage 1 ROP is 34 weeks and threshold ROP is 34-38 weeks. So the crucial period for detection of ROP is from 34-38 weeks. At this age the infant is likely to reach the threshold stage of disease and appropriate treatment at this stage may prevent the blindness.[10]

The most widely used classification for ROP is the International Classification of Retinopathy of Prematurity (ICROP) .ROP is categorised based on the severity of the disease into stages (0-5), location of the disease into 3 zones (Zone 1-3), extent of the disease based on clock hours (1-12) and the presence of plus disease.[11].

Early treatment retinopathy of prematurity (ETROP) study classified ROP into type 1 and type 2 ROP. Prompt treatment is indicated for eyes with type 1 ROP and continued serial observations without treatment are recommended for eyes with type 2 ROP.[12]

Presence of ROP on the first examination, posterior location, increasing severity of stage, circumferential involvement, plus disease and rapid progression are the risk factors which necessitates treatment.[1]

There are multiple treatment modalities available for management of ROP like laser photocoagulation,cryo therapy and anti-VEGF therapy.[3,12]

Infants with significant ROP have increased risk of high myopia, refractive errors, strabismus, amblyopia, astigmatism, retinal detachment and glaucoma.[1,10,13] Currently no definitive methods are available for the prevention of ROP. Since most of the risk factors associated with ROP mentioned above arise in the neonatal intensive care unit (NICU) itself and most of them are avoidable, cautious monitoring of the risk factors, early screening, follow up and surgical intervention have been shown to reduce the incidence and improve the outcome of ROP.[2] Some studies observed that the incidence of ROP is more in small for gestation age babies compare to appropriate for gestational age babies, but other noted no difference. So, In view of paucity of Indian studies on the incidence and risk factors of ROP especially from the northern parts of India, the present study is undertaken.

6.2 REVIEW OF LITERATURE

Prendiville A, Schulenburg WE at London in 1988 did a prospective study, to determine the incidence and severity of ROP in inborn infants of less than 1500 gms at birth and the risk factors associated with the development of ROP in infants of less than 31 weeks GA. 140 infants were examined, and 42 (30%) developed ROP. 15 of these infants had progression to advanced disease (stage III or stage IV). 117 of the infants were of less than 31 weeks of GA and 34 of them developed ROP. Three risk factors: acidosis with a pH less than 7.2, hyperoxia with an oxygen tension more than 12 kilo pascals and GA, were found to be independent risk factors associated with the development of ROP.[14]

In 1991, Palmer EA at Portland did a multicentre trial on incidence and early outcome of ROP in 4099 infants of birth weight less than 1251 gms by serial ophthalmic examination from 4-6 weeks. They found the overall incidence of ROP to be 65.8% and 81.6% in infants less than 1000 gms. Incidence was closely related to the post conceptional age than the postnatal age indicating that the level of maturity governed the age of onset rather than the environmental influence.[15]

Flynn JT at Miami in 1992 did a cohort study on trancutaneous oxygen tension and incidence and severity of ROP in 101 preterm infants of birth weight 500-1300 gms requiring continuous oxygen. They were monitored for transcutaneous oxygen levels and it was concluded that there was positive correlation between incidence and severity of ROP and continuous oxygen levels of more than or equal to 80 mmHg.[16]

Mittal M at Washington in 1994 did a prospective study on candida sepsis and its association with ROP in 253 preterm babies of 1000 gms. It was concluded that candida sepsis is independently associated with increased severity of ROP and the need for laser surgery in extremely low birth weight infants.[17]

Study on incidence of ROP in a neonatal care unit in 1995 from Chandigarh by Charan R determined the incidence of ROP in a prospective manner. 165 preterm babies of birth weight <= 1700 gm were examined over a period of 1 year. An incidence of 47.27% of ROP was detected. The maximum stage reached was stage 1 in 16.97%, stage 2 in 17.58%, stage 3 in 11.52% and stage 4b in 1.21% babies. Plus disease was present in 10.3% babies. The study recommended screening for all babies weighing less than or equal to 1700 gm.[18]

In 1996, Rekha S at Bangalore took up study on incidence of ROP in high risk babies of NICU with a study of risk factors. The overall incidence of ROP was found to be 46%, in babies with birth weight less than 1000 gms, it was 73% and in less than 1500 gms, it was 47%. Oxygen therapy and anemia were found to be independent risk factors. They concluded that all the preterm babies should be screened.[5]

Higgins RD, in 1998 at New York did an observational cohort study in preterms less than 1250 gms to assess the risk factors of ROP in urban population. 63 infants were included in the analysis. Infants whose mothers received antenatal dexamethasone had a significantly less chance of developing ROP that was stage 2 or higher than the infants without a history of antenatal dexamethasone

exposure. The association was stronger when the analysis was restricted to infants who were 24 to 28 weeks of GA. birth weight, GA, respiratory distress syndrome, bronchopulmonary dysplasia, and patent ductus arteriosus were also found to be having significant association with the development of ROP that was stage 2 or higher.[19]

Gupta VP in 2004 at Delhi in his cohort study of 60 preterms on risk factors of on ROP concluded that indirect ophthalmoscopy should be performed at 4 weeks of post natal age in all preterm babies of birth weight less than or equal to 1500 gms and the screening should be intensified in the presence of risk factors like oxygen administration, apnoea and septicemia. The incidence of retinopathy was 21.7% in the cohort, 33.3% in babies of less than or equal to 32 weeks of GA and 36.4% in babies weighing less than or equal to 1250 gm. Oxygen administration, sepsis and apnoea were found to be independent risk factors of ROP. ROP was significantly more severe in babies with hyaline membrane disease and lower birth weight. Severe disease was never seen before 6.5 weeks of age.[20]

In 2008, Chawla D in a study at New Delhi on the risk factors of ROP concluded that with improved survival of very low birth weight infants in India, ROP is becoming a significant problem. The most important amongst the risk factor of ROP was prematurity. Other factors like, problems with oxygenation, frequent blood transfusions, sepsis and apnea have also been implicated in the causation of ROP. The study also suggested that a good screening program is essential for the early detection and treatment of this condition since ROP is essentially asymptomatic in the initial stages.[21]

In 2009, Austegn D in Sweden did a study on the incidence of ROP in extremely preterm infants less than 27 weeks during a 3 years period at Sweden. They concluded that ROP had an incidence of 72.7%. The study also revealed that GA had a stronger correlation with ROP than birth weight and risk of ROP decreased by 50% for each wk of GA at birth.[22]

In 2009, fortes filho did a prospective cohort study which included preterm infants with birth weight (BW) ≤ 1,500 grams and gestational age (GA) ≤ 32 weeks and divided into two groups: AGA or SGA. A total of 345 patients were examined: 199 included in the AGA group and 146 in the SGA. The prevalence of any stage ROP and severe ROP (needing treatment) was 29.6 and 7.0%, respectively. ROP in any evolutive stage developed in 66 AGA (33.2%) and in 36 SGA (24.7%) (p = 0.111). Severe ROP occurred in 15 AGA (7.5%) and in nine SGA (6.2%) (p = 0.779). This study has shown that being SGA was not a significant risk factor for any stage ROP or for severe ROP in this cohort and, also, that the risk factors for ROP were similar among SGA and AGA very-low- birth-weight preterm babies.[23]

In 2011 Sumru Kavurt et al, did a prospective study on neonates with gestational age ≤32 weeks or birth weight ≤1500g. Of the 495 neonates screened, 43 (8.7%) infants were small for gestational age; the frequency of severe retinopathy of prematurity was 5.8%. Sepsis and being small for gestational age were independent risk factors for severe retinopathy of prematurity.

6.3 AIMS AND OBJECTIVES OF THE STUDY

1. To determine the incidence of ROP in preterm neonates and associated risk factors.
2. To compare the incidence of ROP in preterm SGA neonates with preterm AGA neonates.

7.0 MATERIAL AND METHODS

7.1 SOURCE OF DATA

All the preterm neonates born in or referred to Dayanand Medical College and Hospital, Ludhiana, Punjab will be prospectively screened for ROP in NICU and followed up in department of ophthalmology OPD from November, 01 2018 to March 31st 2020.

DESIGN OF STUDY- Prospective cohort

7.2 METHODS OF COLLECTION OF DATA

INCLUSION CRITERIA

Preterm neonates with GA ≤ 34 weeks

EXCLUSION CRITERIA

1. Who will not give consent
2. Who has major congenital anomaly which is incompatible with life
3. Preterm neonates with GA >37weeks.

METHODS (ROP SCREENING PROCEDURE)

1.All patients will undergo complete clinical history taking and risk factor analysis

2.Informed Consent will be obtained from parents

3. Screening procedure will be done by experienced ophthalmologist in NICU under supervision of neonatologist and will further followed up in eye opd after discharge.
4. Pupillary dilation will be done using eye drops tropicamide 0.8% and phenylephrine 0.5%.
5. The baby will be swaddled and arms restrained to minimise general

movements and an assistant will position the baby for the examination.

6. Topical anesthetic drop proparacaine 0.5% will be applied at conjunctival sac.
7. After instillation of topical anesthesia, a sterile wire lid speculum and scleral indentor for eye rotation will be used. Pediatric speculum will be applied 30 seconds after anesthetic drop.
8. First the anterior segment of the eye will be examined to look for tunica vasculosa lentis, pupillary dilation, lens and media clarity.
9. Binocular indirect ophthalmoscopy will be done using a 20 D lens, and scleral depression will done, when necessary, to identify peripheral retinal alterations.
10. Retinopathy will be graded based on the International Classification of ROP.
11. Maturity of retina, zone of retinopathy, clock hours involved, presence of plus disease, and stage of ROP will be recorded.
12. Appropriate treatment will be initiated for indicated babies

OUTCOME

1. Incidence of ROP
2. Incidence of ROP in AGA and SGA neonates

STATISTICAL ANALYSIS

Data were described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the study groups was done using ANOVA. For comparing categorical data, Chi square ($\chi 2$) test

was performed and exact test was used when the expected frequency is less than 5. A probability value (p value) less than 0.05 was considered statistically significant. All statistical calculations were done using SPSS (Statistical Package for the Social Science) SPSS 21.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

NO

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Yes attached herewith

LIST OF REFERENCES

1. Vanderveen DK, Zupancic JAF. Retinopathy of Prematurity. 6th ed. In: Cloherty JP, Eichenwald EC, Stark AR, eds. Manual of neonatal care. Philadelphia, PA: Lippincott Williams & Wilkins; 2010 p. 640-4.
2. Singh M. Miscellaneous conditions: Retinopathy of prematurity 7th ed. In: Care of the newborn. New Delhi: Sagar Publications; 2010. p. 425-42.
3. Lee TC, Chiang MF. Pediatric Retinal vascular Diseases. In: Ryan SJ, Sadda SR, Hinton DR, Schachat AP, Wilkinson CP, Wiedemann P, (editors). Retina. Fifth edition, vol 2. Elsevier: London; 2013. p. 1165-87.
4. Chaudhari S, Patwardhan V, Vaidya U, Kadam S, Kamat A. Retinopathy of prematurity in a tertiary care center – incidence, risk factors and outcome. Indian Pediatr. 2009;46:219-224.
5. Rekha S, Battu RR. Retinopathy of prematurity incidence and risk factors. Indian Pediatr. 1996;33:999-1003.
6. Maini B, Chellani H, Arya S. Retinopathy of Prenaturity : Risk factorand role of antenatal betamethasone in indian preterm newborn babies. J Clin Neonatol. 2014;3:20-4.
7. Gilbert C, Fielder A, Gordillo L, Quinn G, Semiglia R, Visintin P, et al. Characteristics of infants with severe ROP in countries with low moderate and high levels of development, implications of screening programmes. Pediatrics. 2005;115:515-8.
8. Gilbert C, Rahi J, Eckstein M, Osullivan J, Foster A. Retinopathy of prematurity. Lancet. 1997;350:12-14

9. Gergly K, Gerinec A. Retinopathy of prematurity- epidemics, incidence, prevalence, blindness. Bratisl Lec Listy. 2010;111:514-7

10. Chawla D, Agarwal R, Deorari A, Paul VK, Chandra P, Azad RV. Retinopathy of prematurity. In: AIIMS NICU protocols; Available at http://www.newbornwhocc.org/pdf/ROP_140810_300810.pdf.

11. The international classifications of retinopathy of prematurity revisited. Arch Ophthalmol. 2005;123:991-9.

12. Early Treatment for Retinopathy of Prematurity Cooperative Group. Revised indications for treatment of retinopathy of prematurity: results of the early treatment for retinopathy of prematurity randomized trial. Arch Ophthalmol 2003;121:1684–96

13. Quinn GE, Dobson V, Repka MX, Reynold J, Kivlin J, Davis B, et al. The Cryotherapy for retinopathy of prematurity cooperative group. Development of myopia in infants with birth weights less than 1251 grams. Opthalmology. 1992;99:329-40.

14. Prendiville A, Schulenburg WE. Clinical factors associated with retinopathy of prematurity. Arch Dis Child. 1988;63:522-7.

15. Palmer EA, Flynn JT, Hardy RJ, Phelps DL, Phillips CL, Schaffer DB, et al. The Cryotherapy for Retinopathy of Prematurity Cooperative Group. Incidence and early course of retinopathy of prematurity. Ophthalmology 1991;98:1628-40.

16. Flynn JT, Bancalari E, Snyder ES, Goldberg RN, Feuer W, Cassady J, et al. A cohort study of transcutaneous oxygen tension and the incidence and severity of retinopathy of prematurity. N Engl J Med. 1992;326:1050-4.

17. Mittal M, Dhanireddy R, Higgins RD. Candida sepsis and association with retinopathy of prematurity. Pediatrics. 1998;101:654-7.

18. Charan R, Dogra MR, Gupta A, Narang A. The incidence of retinopathy of prematurity in a neonatal care unit. Ophthalmology. 1995;43:123-6.

19. Higgins RD, Mendelsohn AL, DeFeo MJ, Ucsel R, Hendricks-Munoz KD. Antenatal dexamethasone and decreased severity of ROP. Arch Ophthalmol. 1998;116:601-605.

20. Gupta VP, Dhaliwal U, Sharma R, Gupta P, Rohatgi J. Retinopathy of prematurity –risk factors. Indian J Pediatr. 2004;71:887-92.

21. Chawla D, Agarwal R, Deorari AK, Paul VK. Retinopathy of prematurity. Indian J Pediatr. 2008;75:73-6.

22. Austeng D, Källen KB, Ewald UW, Jakobsson PG, Holmström GE. Incidence of retinopathy of prematurity in infants born before 27 weeks' gestation in Sweden. Arch Ophthalmol. 2009;127:1315-9.

23. Fortes Filho JB, Valiatti FB, Eckert GU, Costa MC, Silveira RC, Procianoy RS, et al. Is being small for gestational age a risk factor for retinopathy of prematurity? A study with 345 very low birth weight preterm infants. J Pediatr (Rio J). 2009;85:48-54.

PROFORMA

S.No.

IDENTIFICATION DATA

MRD no	
Baby name	
Mother's name	
Mothers age	
Address	
Telephone no	

BIRTH DETAILS

Date of birth	
Gestational age(weeks)	
Expected date of delivery	
Birth weight(g)	
Sex	
Birth order	
Multiple/singleton pregnancy	
Mode of conception(natural/ivf)	

Signature of Candidate

Signature of Supervisor

NEONATAL RISK FACTOR

Respiratory Distress Syndrome	
Neonatal Hyperbilirubinemia	
Diabetes	
Anaemia	
Surfactant	
Sepsis	
Seizure	
Intraventricular Haemorrhage	

Hypertension	
Fetal distress	
Oxygen	
Blood transfusion	
Patient Ductus Arteriosus	
Phototherapy	

MATERNAL RISK FACTORS

1.Pregnacy Induced Hypertension

2.Gestational Diabetes Mallitus

3.ANAEMIA

4.REVERSAL OF DIASTOLIC FLOW

ROP SCREENING

Date-

PMA-

Signature of Candidate

Signature of Supervisor

Normal vasculogenesis

	RE.			LE		
Mature						
Immature zone	1	2	3	1	2	3
Normal vasculogenesis						

I

ROP

	RE.	LE
ZONE		
STAGE		
Preplus		
Plus		
APROP		
Regressing		
Regressed		

TREATMENT ADVICE

Observational	Laser	Anti-VEGF

FOLLOW UP:-

Signature of Candidate **Signature of Supervisor**

INFORMED PATIENT CONSENT

Date: _____

I.....F/o, M/o..... am willing to give my consent for my child's participation in the study **"TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out of the study any time without assigning any reason.

.....
Signature of the Witness

Name:

.....
Signature of the Parent

Signature of Candidate

Signature of Supervisor

मरीज अनुमति फार्म

तिथि _____

मैं _____ पिता/ माता_____ निवासी _____

अध्ययन **"TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS"** में अपने बच्चे की भागीदारी के लिए मेरी सहमति देने को तैयार हूं। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्व
कृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____
गवाह के हस्ताक्षर
नाम:

_____
पिता/ माता के हस्ताक्षर/अंगूठे का निशान
नाम:

_____
अन्वेषक के हस्ताक्षर

_____
विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ ਪਿਤਾ / ਮਾਤਾ _____

ਵਾਸੀ _____

ਅਧਿਐਨ **"TO STUDY THE INCIDENCE OF RETINOPATHY OF PREMATURITY IN PRETERM NEONATES ≤34 WEEKS"** ਵਿਚ ਮੇਰੇ ਬੱਚੇ ਦੀ ਭਾਗੀਦਾਰੀ ਲਈ ਮੇਰੀ ਸਹਿਮਤੀ ਦੇਣ ਲਈ ਤਿਆਰ ਹੈ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

_____ _____

ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ ਪਿਤਾ/ਮਾਤਾ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ _____

_____

ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

_____

ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ